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ABSTRACT

Presented is a two-volume study of the characteristics of students identified as handicapped from educational, clinical, and psychological evaluations. The first volume describes an analysis (based on surveys collected by the National Center for Health Statistics) of the affects on identification of 14,185 6- to 17-year old students of family income, race, population size of place of residence, and geographic location. Among six primary findings reviewed are that all three types of teacher-identified handicaps (physical, mental, and speech) were significantly concentrated in the low income elementary school population, and that teachers identified both mental and speech handicaps at a significantly more frequent rate for Black than White elementary students. The second volume explores variations in rates and the characteristics of over 7,000 students (6-11 years old) selected by teacher recommendations, medical examination findings, school behaviors, test scores, developmental histories, and parent responses as possibly needing special education resources. Findings are detailed for eight types of handicapping conditions, including hearing and visual impairments, speech handicaps, and mental retardation. Among findings noted are the small overlap and lack of agreement in children identified by sets of selected indicators, although there was a consistent pattern of identification found across socioeconomic groups for many handicapping conditions. It is explained that the studies have implications for emphasizing the importance of the federal requirement for multiply assessment of children prior to special education placement. (CL)

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STUDIES OF HANDICAPPED STUDENTS

Volume I Whom Do Teachers Identify As Handicapped?

Research Report
EPRC 4537-11

Prepared for:

OFFICE OF THE
ASSISTANT SECRETARY FOR EDUCATION
DEPARTMENT OF HEALTH, EDUCATION
AND WELFARE
WASHINGTON, D.C. 20202

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SRI Project 4537 *December 1975*

Educational Policy Research Center

PATRICIA A. CRAIG
NORMAN B. McEACHRON

Research Report
EPRC 4537-11

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EXECUTIVE SUMMARY

This volume reports the first of two studies conducted by the Educational Policy Research Center (EPRC) of SRI for the Assistant Secretary for Education (ASE) on the handicapped school population. The volume presents data on patterns of socioeconomic and demographic characteristics of teacher-identified handicapped students. The purpose of the analysis was to determine whether significant differences in rates of identification of handicapping conditions are associated with family income, race,population size of place of residence, or geographic location. This study briefly reviews past studies; explores a new set of data to determine its usefulness in determining characteristics of the teacher-identified handicapped student population; and presents the results of the analysis of these new data and their implications for future policy purposes.

The second study, currently in progress, compares the findings of this volume, which are based on teacher evaluations, with findings based on clinical and psychological assessments.

Data Base

The baseline data used in this analysis were a series of unpublished cross-tabulations of information collected by the National Center for Health Statistics (NCHS) in its health examination surveys of children and youth. These surveys were conducted between 1963 and 1970 with a total sample of 14,185 randomly selected, noninstitutionalized 6 to 17 year olds, broken into 6 to 11 and 12 to 17 year old groups. NCHS found that 99.3% of the 6 to 11 age group and 96.0% of the 12 to 17 age group attended public, private, or parochial schools.

Multiple assessments were collected on each subject. Data sources included a medical examination by a pediatrician; psychological and ability tests given by a psychologist; teacher assessment; parental assessment; and, in the case of the 12 to 17 year old population, personal assessment. In this volume, rates of identification are derived from teacher assessments--teacher reports of special-education student needs. Data on family income are based on responses from the subjects' parents.

Until this use of the NCHS data, there was no reliable baseline data from which to establish prevalence rates or examine possible shifts in either identification patterns or prevalence. Any such shifts would, of course, be important for both federal and state education policy.

During the mid-1980s, two additional major sources of reliable information on the characteristics and possible needs of the school-age handicapped will become available. The NCHS data from the 1960s will provide valuable reference points for analyzing findings.

- Data from a series of special questions relating to handicapping conditions that will be asked of households in the 1980 Census.
- Results of a NCHS survey planned for 1979.

Although the NCHS data has some limitations, they are relatively minor and far outweighed by the data's assets. This is particularly apparent in comparisons with the characteristics of other available data sources. For identifying student population characteristics across the dimensions of health and school performance, the NCHS survey data provide a reliable national data base because:

- The survey covered six major handicaps with uniform reporting methods.
- The data are based on multiple assessment of individual subjects.
- The data are based on a large, random, representative, national sample.
- Sophisticated statistical methodology provided standard errors of estimates.
- The data are standardized across geographic regions.

The data cover six handicapping conditions: problems of vision, hearing, orthopedics, mental retardation, emotional disturbance, and speech. It was not possible, in this limited analysis, to report on learning disabled students because there were ambiguities in both the classification and reporting of this condition in the NCHS data. However, problems of the learning disabled will be addressed in Volume II of this study.

An earlier report, EPRC Research Note 19, 3 January 1975, discussed problems of unreliable estimates of handicapping conditions, particularly mental handicaps. The assessment procedures for identifying mental retardation and emotional disturbance are generally far more subjective than those used for physical handicaps such as orthopedic, hearing, and vision problems. As a result, we consider it important to examine population estimates for mental and physical handicaps separately.

The category of speech handicaps also has unique characteristics and should therefore also be considered separately. As presented in Research Note 19, approximately 45% of the elementary school population identified as handicapped is categorized as requiring speech services. In addition, the number of speech handicaps, unlike that of either physical or most mental handicaps, decline significantly during the elementary years.

An analytical distinction is also made between the elementary and secondary grade levels. For our purposes, the 6 to 11 age group and the elementary school population are identical as are the 12 to 17 age group and the secondary school population. Far fewer students at the secondary than at the elementary level are identified as requiring special-education services for the handicapped. Part of this difference is due to declines in reported needs for speech therapy and services for emotional disturbance. Evidence of these changes is found not only in the NCHS data but also in the National Center for Educational Statistics' (NCES) 1970 study, Number of Pupils with Handicaps in Local Public Schools.

The summarized cross-tabulations obtained from NCHS were tested statistically for significant patterns and trends in the teacher identification of students requiring special-education services.

Conclusions and Policy Implications

There are six primary findings of this analysis:

- All three types of teacher-identified handicaps (physical, mental, and speech) are significantly concentrated in the low-income elementary school population.
- Among secondary school students, the incidence of teacher-identified mental and speech handicaps increases with diminishing family income; physical handicaps show much less of this tendency.
- Teachers identify both mental and speech handicaps at a significantly more frequent rate for black than for white elementary school children.
- For secondary school students, mental retardation is reported significantly more frequently for blacks than whites.
- For the demographic dimension of city size, the only significant finding is a rise in rates of teacher-identified emotional disturbance among 12 to 17 year olds with the increase of city size from rural to urban.
- Although there are regional differences in teacher-identified handicaps, they are somewhat puzzling and do not suggest a definite pattern.

A question with direct bearing on formulating policy and funding strategies is whether systematic identification patterns exist. Such patterns might indicate need to drop the current assumption that handicaps are distributed evenly between the elementary and secondary school populations and uniformly across socioeconomic and demographic variables, and to more carefully tailor targeting of funds for handicapped students.

It is not possible to conclude that the patterns of teacher-identified handicaps reported here represent true handicap prevalence rates. An objective of our second study which will be reported in Volume II, is to establish population profiles by evaluating the NCHS clinical assessments and developmental histories, and by comparing them with teacher evaluations. However, although there may be a change in rates, we do not expect that the underlying patterns described in this volume will change appreciably. In addition, the rates reported here represent reliable data on teachers' perceptions of special need, and on this basis are important. They provide significant new information on the characteristics of children identified by the schools as requiring special-education services. This information contradicts previous assumptions about handicapped students.

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INTRODUCTION

This volume presents patterns of socioeconomic status (SES) and demographic characteristics of noninstitutionalized students identified by teachers as requiring special-education services. We were particularly interested in determining whether significant differences exist in the distribution of teacher-identified handicaps across the following variables; age, race, family income, population size of place of residence, and geographic region.

Current funding strategies are based on the assumption that handicaps are distributed evenly between the elementary and secondary school populations and uniformly across SES and demographic variables. A question with direct bearing on formulating policy is whether systematic identification patterns exist that might suggest modifications of either federal guidelines or funding formulas.

Past attempts to investigate the characteristics of the handicapped school population have been frustrated by the absence of standardized data across geographic regions. This problem was partly a result of investigators relying on individual state reports of handicapping conditions. The great variations in state legislation, which differ both in language and the range of handicaps defined for state programs, preclude comparability among state reports. Therefore, studies in the past, based on aggregate data from state reports of handicapped children, have produced ambiguous results. This volume will review briefly past studies; explore a new set of data to determine its usefulness in determining characteristics of the teacher-identified handicapped student population; and present the results of the analysis of these new data and their implications for future policy purposes.

HISTORICAL AND CURRENT POPULAR ESTIMATES

Table 1 presents estimates of the percentage of handicapped children in the school-age population which have been used in the field of special-education for the past twenty years. Because these estimates have appeared to be the best sources available, they have acquired an aura of authenticity, although their authors have, in all cases, acknowledged weaknesses in reliability or standardization of measurement. Romaine Mackie, the author of the earliest widely used national figures, developed prevalence rates from "educated guesses" of education specialists. Operational definitions for classifying children into handicapped categories were not delineated, and Mackie carefully indicated the lack of methodological sophistication.

After its establishment in 1968, The Bureau of Education for the Handicapped (BEH), in cooperation with the National Center for Educational Statistics (NCES), attempted to correct these earlier ambiguous figures through a state-by-state survey. The survey covered the number and kinds of handicapped public school students needing special services and the number actually served. The NCES-BEH study was the first major attempt to survey the entire handicapped public school population within a somewhat rigorous framework, and it produced the best estimates available at the time. However, these data too were limited by poor reliability since they were collected by different methods in different states. Recently, NCES has revised its Public Accounting Manual for Local and State School Systems in order to eliminate future survey problems. The revision supplies detailed criteria for reporting handicapped populations.

Table 1

SELECTED ESTIMATED PREVALENCE RATES OF THE SCHOOL-AGE NONINSTITUTIONALIZED HANDICAPPED

		Handicap (percent handicapped in total school populations)									
Source[†]	Year	Visual	Hearing	Speech	Ortho-pedic	Special[*] Health	Emotional Distur-bance	Mental Retar-dation	Learn-ing Dis-ability	Mul-tiple Handi-capped	Total
Mackie	1954	0.20	1.50	2.0	1.50	1.50	2.0	2.00	n.a.	n.a.	10.70
Mackie	1963	0.90	0.58	3.5	1.00	1.00	2.0	2.30	n.a.	n.a.	10.47
BEH[‡]	1968	0.10	0.58	3.5	0.50	n.a.[§]	2.0	2.30	1.00	n.a.	9.98
Mackie	1969	0.10	0.60	3.5	0.75	0.75	2.0	2.30	n.a.	n.a.	10.00
Rossmiller	1970	0.05	0.10	3.6	0.21	n.a.	2.0	1.54	1.12	0.07	8.69
BEH	1970 1971	0.10	0.58	3.5	0.50	n.a.	2.0	2.30	1.00	0.06	10.04
Fleischmann	1973	0.10	0.58	3.5	0.50	n.a.	2.0	1.54	1.00	0.06	9.28
Taylor	1973	0.20	0.57	3.5	0.50	n.a.	2.0	3.03	2.50	0.06	12.38
BEH	1974	0.20	0.57	3.5	0.50	n.a.	2.0	3.00	2.50	0.06	12.35

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[*] Since 1970 this classification has been included with orthopedic.

[†] All references appear in the bibliography.

[‡] BEH = Bureau of Education for the Handicapped.

[§] Not applicable.

The other frequently cited prevalence studies are those of Richard Rossmiller, Graeme Taylor, and the New York State Fleishmann Commission. Neither the Rossmiller nor Taylor figures are based on original data collection, but were derived from a combination of individual state studies and the NCES-BEH figures. Although the Fleischmann Commission supported an independent survey of New York State schools, the staff eventually pooled estimates from diverse sources to arrive at a compromise set of projections.

None of the authors of these studies have claimed that their estimates are precise. However, in the absence of other data, these sources have been used to extrapolate handicapping conditions for the preschool as well as the entire school-age population. Both federal and state policy have been based on these extrapolations.

A basic assumption in projecting handicaps using fixed prevalence rates has been that all handicaps are distributed evenly across age and racial groups, family income levels, and other socioeconomic dimensions. However, there is evidence that assumptions of uniform distribution are probably incorrect--although the causes of differential prevalence remain unclear. For example, there is little question that significant numbers of children from low-income families and nonwhite ethnic backgrounds have been erroneously assigned to classes for the mentally retarded and emotionally disturbed; there is also strong reason to believe that environmentally related conditions such as poor nutrition and greater exposure to lead poisoning may produce a higher incidence of certain handicaps among these groups (Baer, 1972; Goodman et al., 1956; Hurley, 1968; Needleman and Shapiro, 1974; Neer et al., 1973; Pueschel, 1974; Sachs, 1974; Sholtz et al., 1973; Wallace 1973).*

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*References appear in the bibliography.

Another assumption, which underlies the application of fixed prevalence rates across all age groups, is that handicaps, as they relate to the need for special educational services, are not ameliorated by either the schools or maturation. For speech, and possibly emotional disturbances, this assumption appears to be false, and it may be false for other handicaps as well. The NCES-BEH study of 1970, which differentiated elementary and secondary school needs for special services, reported that 6.1% of students at the elementary level were identified as requiring speech therapy, in comparison with only 1.1% of secondary school students. However, it is unclear whether speech problems are reduced through speech therapy offered by the schools or normal maturation processes. In either case, the need for such services declines smoothly and significantly through the school grades, as reported in our Research Note 19 (1975).

Recently, two studies have demonstrated the lack of standardized national data. In 1974, the Rand Corporation published a study of services for the handicapped school-age population, Improving Services to Handicapped Children. This study focused on delivery mechanisms and discussed prevalence only in terms of existing data. It concluded that no reliable data providing comparability across states existed.

Most recently, at the request of Congress, a report known as the nine states study was produced jointly by the Office of the Assistant Secretary for Planning and Evaluation and NCES. The purpose of the study was to survey selected states to determine the availability of information on both the number of children being served by special education classes and the associated costs. The study concluded that standard and complete information could not be obtained from the states, and therefore, at least for the near future, it was impossible to rely on state reporting for data.

USE OF THE NATIONAL HEALTH EXAMINATION SURVEY

A national data source that provides standardized national and regional data on the school-age population is the National Health Examination Survey of Children and Youth by the National Center for Health Statistics (NCHS). Until now, this source has been used only to examine student health characteristics. The survey, which was part of a congressionally mandated series of studies on the health of the nation, was a study of the 6 to 17 year old population. Between 1963 and 1970 school-related information as well as data on health characteristics were collected on each of a total sample of 14,185 randomly selected, noninstitutionalized individuals. This sample was selected in cooperation with the U.S. Bureau of Census so that it would be representative of the 6 to 17 year old continental U.S. population with respect to age; sex; race; and characteristics of the place of residence, including region of the country, and population size and growth.

Extensive multidisciplinary data were collected on each individual in the sample. Sources included a medical examination by a pediatrician; achievement and psychological tests given by a psychologist; teacher assessment of special educational needs; parental assessment of early childhood development; and, in the case of the 12 to 17 year old age group, personal assessments of health and development. This volume presents the teacher assessments of student need for special services for the handicapped and the relationship of patterns of these assessments to student SES and demographic variables.

The survey was conducted in two cycles, Cycles II and III. (Cycle I, conducted in the early 1960s, surveyed the adult population.) Between

1963 and 1965 information was gathered on the 6 to 11 age group, between 1966 and 1970 on the 12 to 17 age group. The response rates for both survey cycles were extremely high, with a 96% response from teachers assessing the first group and 92% response from teachers assessing the second group. Careful methodological controls were used to minimize biases and nonsampling errors.

Of the children aged 6 to 11 examined by NCHS, 99.3% were enrolled in a public, parochial, or private school with only 0.7% not attending any type of school. We do not wish to speculate on the causes of non-attendance until we analyze the original NCHS data tapes to establish the characteristics of children not in school. We will consider this issue in our second volume.

The results of the NCHS survey were reported in a series of publications which appear in the bibliography of this report. However, because cross-tabulations of individual variables were not reported by NCHS, the usefulness of the published data for delineating characteristics of the handicapped population is limited. In early 1975, SRI's Educational Policy Research Center (EPRC) recommended in its Research Note No. 19 that a detailed analysis of the NCHS data be made. On special request, NCHS made cross-tabulations of its original data available to EPRC. This volume represents the first phase of the analysis.

As described earlier, for this initial analysis we selected the NCHS teacher reports of need for special-education services to investigate relationships between patterns of identification and various student SES and demographic variables. A particular advantage of these data is that they are organized by handicap categories that correspond closely to the categories used in current identification practices in schools. Therefore the data can be related easily to existing state reports.

However, an important value of the NCHS data is its potential for comparing teacher-reported need for special-education services with the assessments of physicians and psychologists, as well as with student achievement in school. The comparison of these data in a detailed analysis is now underway and will be reported in Volume II.

A limitation of the NCHS data base is that its information is not current, since the surveys were conducted from 1963 to 1970. However, this fact does not necessarily diminish its usefulness in making generalizations. Most considerations related to handicapping conditions are related directly to physical conditions which do not exhibit dramatic changes in prevalence over time except under the most unusual circumstances. One example of such a change is the sharp decline in crippling conditions that resulted from the discovery and use of the Salk polio vaccine.

Until this use of the NCHS data, there was no reliable baseline data from which to establish prevalence rates or examine possible shifts in either identification patterns or prevalence. Any such shifts would, of course, be important for both federal and state education policy.

During the mid-1980s, two additional major sources of reliable information on the characteristics and possible needs of the school age handicapped will become available. The NCHS data will provide valuable reference points for analyzing these findings.

- Data from a series of special questions relating to handicapping conditions that will be asked of households in the 1980 Census.
- Results of an NCHS survey planned for 1979.

Therefore, while these data are old, their age must be balanced against their uniqueness. The NCHS data are unique in that they provide a reliable national data base that contains:

- Six major handicaps covered with uniform reporting methods.
- Data based on multiple assessments of individual subjects.
- Data based on a large, random, representative, national sample.
- Sophisticated statistical methodology which provdes standard errors of estimates for the projected rates.
- Data standardized across geographic regions.

A limitation of this present analysis is our inability to evaluate the extent of the learning disabled population. The NCHS category "slow" learner" and the data in it are too ambiguous to be automatically equated with the category of learning disabled. Until teacher reports can be compared to medical and psychological assessments, the characteristics of slow learner children cannot be identified. This problem will be addressed in Volume II.

Analytic Scope

In this volume the NCHS data is broken down by elementary and secondary education levels. For our purposes, the 6 to 11 age group and the elementary school population are identical, as are the 12 to 17 age group and the secondary school population. One important aspect of our earlier work, Research Note 19, is that it emphasized the importance of age group differences in teacher-reported need for special education services. These differences are shown in Table 2.

The data are also broken down into three categories of handicapping conditions:

- Physical handicaps
    - Vision
    - Hearing
    - Orthopedic
- Mental handicaps
    - Mental retardation
    - Emotional disturbance
- Speech handicaps.

Table 2

NCHS TEACHER-REPORTED RATES OF HANDICAPS AMONG NONINSTITUTIONALIZED STUDENTS AGED 6 TO 17
(Percent)

	Grade Level	
Handicap	Elementary (1964)	Secondary (1968)
Physical		
Hearing	1.0%	0.3%
Vision	1.4	0.2
Orthopedic	0.3	0.2
Mental		
Mental retardation	1.2	1.3
Emotional disturbance	3.4	1.2
Speech	6.2	1.1
Total	13.5%	4.3%

Source: National Center for Health Statistics, 1975.

This three-way breakdown of handicaps reflects the continued national attention and concern over the misclassification of children in such handicap categories as mental retardation and emotional disturbance which are particularly subject to ambiguous interpretation and allow biases to operate in the placement process. As a result, classes for the mentally retarded and the emotionally disturbed often become dumping grounds for the nonconformist, behavioral problem, or bilingual child who lacks adequate English communications skills. (While these behavior and language problems can have an effect on a child's school placement, they are not always associated with mental retardation or emotional disturbance.)

There appears to be far less confusion and disagreement in identifying children with physical conditions such as hearing, vision, and orthopedic handicaps, which can be defined and identified with more objective test measures. Estimates of these handicaps have also tended to show less fluctuation than those of mental handicaps.

Speech handicaps are considered separately because of their unique characteristics. The need for speech services declines steadily through the elementary and secondary grades. Almost half of all handicapped students at the elementary level are identified as requiring speech services. However, by the time these students enter secondary schools, the rate of identification has dropped by 5.1%, as shown in Table 2.

For these reasons we consider the breakdown by both age and handicap group to be important in the analysis of identification patterns.

General Statistical Considerations

The NCHS survey design and operation for each cycle was organized to minimize bias and variability of measurement techniques. The estimates of standard errors for the rates furnished by NCHS are primarily measures of sampling variability; these variations might occur by chance because only a sample of the population was surveyed. The standard error, as estimated for these tabulations and calculated by the authors for the physical and mental groups of handicaps, also reflects part of the variability arising in the measurement process. It does not include estimates of biases that might be in the data.

Each handicapping condition was considered for the following quantities in relation to age group and the variables of family income, race, region, and population size of place of residence:

(1) Sample totals of subjects for whom school data were obtained in each socioeconomic or demographic category.

(2) Sample totals of subjects in each category identified by teachers as needing a specific educational service.

(3) Population estimates, for the midpoint of each cycle, of the total number of subjects in each category for whom school data were available [obtained from sample totals in (1) by weighting].

(4) Population estimates, for the midpoint of each cycle, of the number of subjects in each category identified by teachers as needing a specific educational service [obtained from sample totals in (2) by weighting].

(5) Population estimates of rates per 100 subjects in each category needing specific educational services [quotient of (4) and (3)].

(6) Standard errors for rates per 100 subjects as given in (5).

From these tabulations for each age group, the authors constructed total rates and standard errors for the three groups of teacher-identified handicapping conditions.

The rates for each handicap group were considered the sum of the rates for the separate handicaps in that group. An individual identified as having two physical handicaps, for example, was counted twice. The resulting group rates, therefore, indicate the total number of identified handicaps per 100 students rather than the total number of individuals per 100 identified as having one or more handicap. Our future work with the NCHS Cycle II tape will allow us to determine the extent of this overlap. Preliminary analysis indicates that approximately 27% of the students have been recommended for one or more special resources by their teachers, including resources for the gifted. However, fewer than one percent of the total sample could be classified as having serious multiple handicaps.

The level of significance used most frequently in this volume is 5 in 100 ($p<0.05$); for indicated differences to be significant the chances must be less than 5 in 100 that they could result from sampling and measurement variations alone. The corresponding level of confidence intervals is 95%. A summary of the analysis of NCHS teacher-reported need for special-education services at the elementary and secondary levels is presented in the following section. A more detailed analysis and discussion of the methodology used to evaluate these data is presented in Appendix A.

A fundamental consideration in this analysis of differences in teacher-identified population characteristics was the relevance of patterns and statistical trends to federal policies on school services for the handicapped.

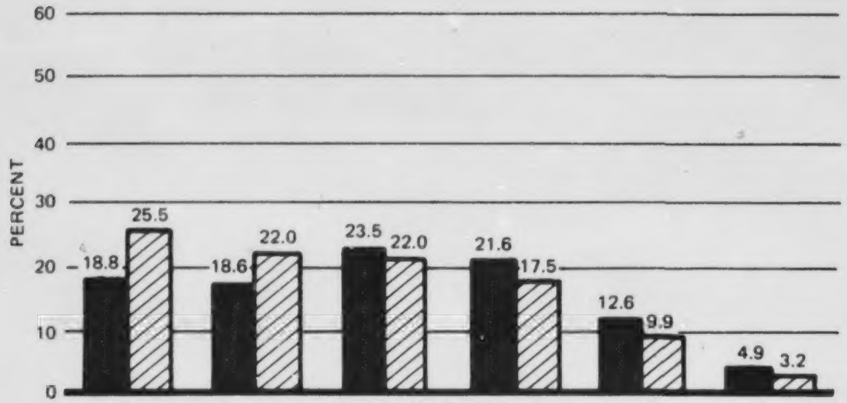
SOCIOECONOMIC AND DEMOGRAPHIC PATTERNS

The principal research question of this study was whether there were any significant differences in rates of teacher identification of handicaps across family income, race, region, and population size of place of residence. Particular effort was directed toward detecting trends across the categories with a natural ordering, family income, and population size of place of residence.

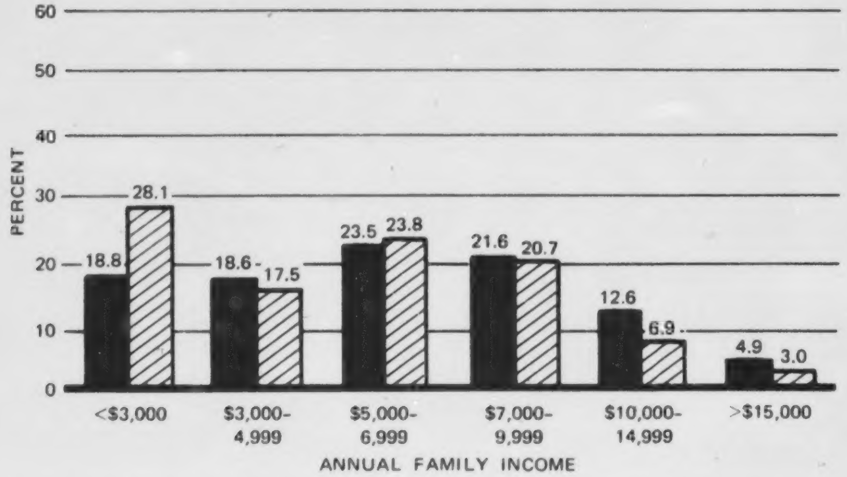
Family Income

In Figures 1(a) through 1(h) the rates of students identified by teachers as needing special services are presented for the three types of handicaps across income levels. Figures 1(a) through 1(d) show the 6 to 11 age group or elementary grade level, and Figures 1(e) through 1(h) show the 12 to 17 age group or secondary grade level. For these two age levels each handicap group is plotted against the total population of all students in each income range. Appendix B presents data on the concentration of students at each income level for each of the six individual handicaps reported.

As shown by these figures, there is a noticeable skew toward the low-income groups for all three handicap categories. In every case, except for vision and orthopedic handicaps in the 12 to 17 age group, these differences in identified need for special services are statistically significant. Students from low-income families are reported to have a much greater need for special services than children from families



(a) ALL TEACHER-IDENTIFIED HANDICAPPED STUDENTS AND ALL STUDENTS, AGED 6 TO 11

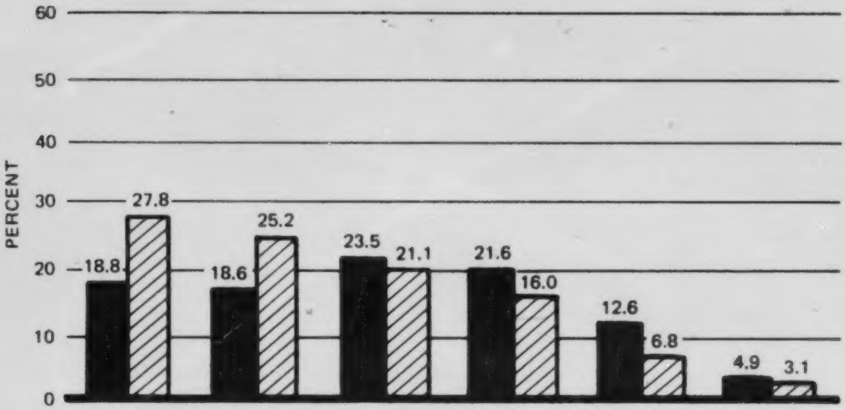


(b) TEACHER-IDENTIFIED PHYSICALLY HANDICAPPED STUDENTS AND ALL STUDENTS, AGED 6 TO 11

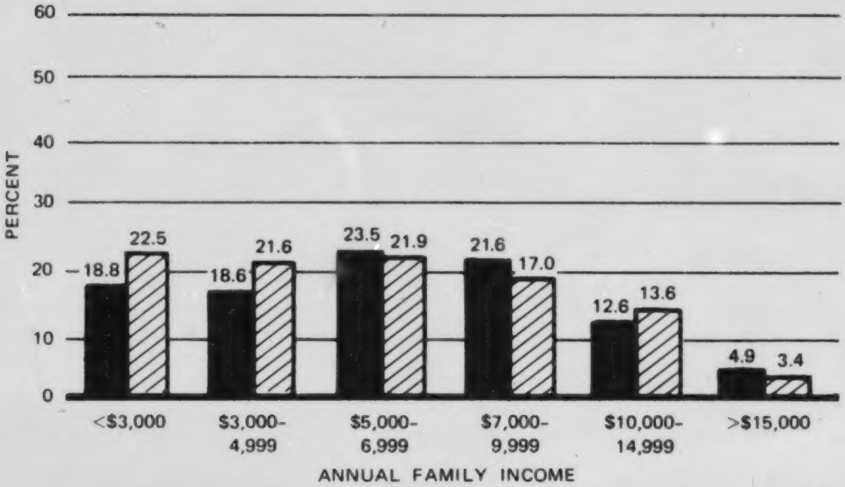
■ Total Student Population Aged 6-11

▨ Student Population, Aged 6-11, Identified as Handicapped

FIGURE 1 DISTRIBUTION, BY FAMILY INCOME, OF TEACHER-IDENTIFIED HANDICAPPED STUDENTS (PERCENTAGE OF POPULATION GROUP, 1964)



(c) TEACHER-IDENTIFIED MENTALLY HANDICAPPED STUDENTS AND ALL STUDENTS, AGED 6 TO 11

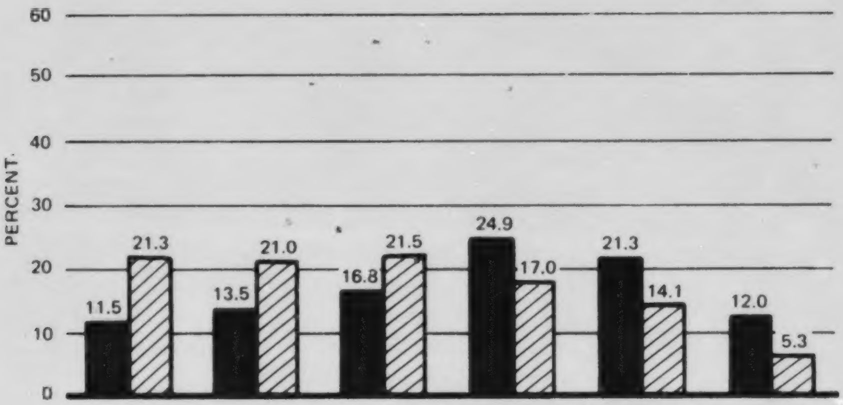


(d) TEACHER-IDENTIFIED SPEECH HANDICAPPED STUDENTS AND ALL STUDENTS, AGED 6 TO 11

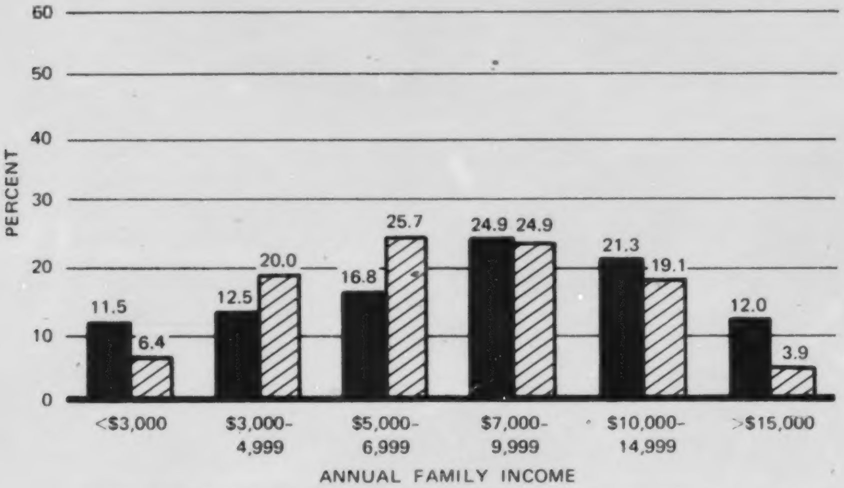
■ Total Student Population Aged 6-11

▨ Student Population, Aged 6-11, Identified as Handicapped

FIGURE 1 DISTRIBUTION, BY FAMILY INCOME, OF TEACHER-IDENTIFIED HANDICAPPED STUDENTS (PERCENTAGE OF POPULATION GROUP, 1964) (Continued)



(e) ALL TEACHER-IDENTIFIED HANDICAPPED STUDENTS AND ALL STUDENTS, AGED 12 TO 17

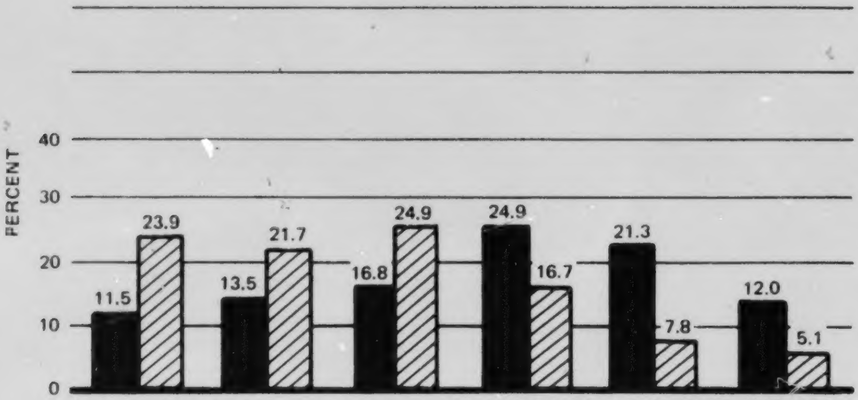


(f) TEACHER-IDENTIFIED PHYSICALLY HANDICAPPED STUDENTS AND ALL STUDENTS, AGED 12 TO 17

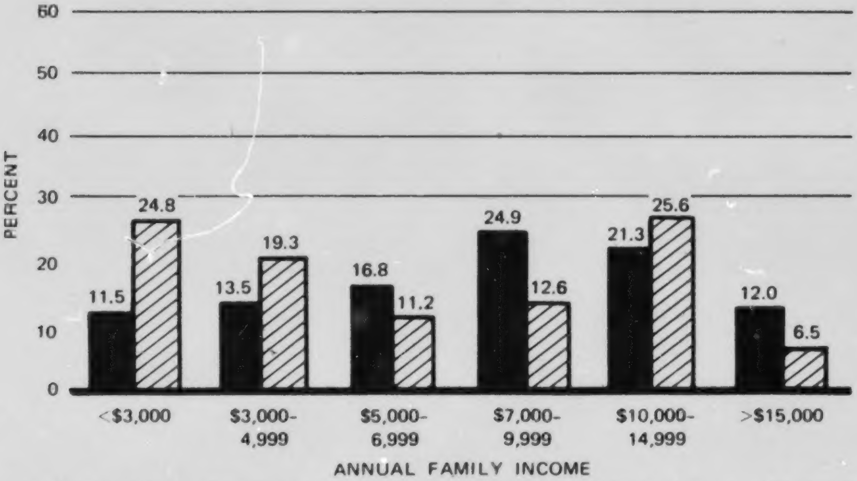
■ Total Student Population Aged 12-17

▨ Student Population, Aged 12-17, Identified as Handicapped

FIGURE 1 DISTRIBUTION, BY FAMILY INCOME, OF TEACHER-IDENTIFIED HANDICAPPED STUDENTS (PERCENTAGE OF POPULATION GROUP, 1964) (Continued)



(g) TEACHER-IDENTIFIED MENTALLY HANDICAPPED STUDENTS AND ALL STUDENTS, AGED 12 TO 17



(h) TEACHER-IDENTIFIED SPEECH HANDICAPPED STUDENTS AND ALL STUDENTS, AGED 12 TO 17

■ Total Student Population Aged 12-17

▨ Student Population, Aged 12-17, Identified as Handicapped

FIGURE 1 DISTRIBUTION, BY FAMILY INCOME, OF TEACHER-IDENTIFIED HANDICAPPED STUDENTS (PERCENTAGE OF POPULATION GROUP, 1964) (Concluded)

in higher income categories; the difference between the groups is much greater than would be normally expected as a result of chance fluctuations in the survey.

Table 3 presents these rates, dramatically illustrating the decline in teacher-reported need with increases in family income.

Table 3

DISTRIBUTION, BY FAMILY INCOME, OF TEACHER-IDENTIFIED HANDICAPS
(Percentage of Age/Family Income Group,
Identified by Handicap)

	Handicap					
	6-11 Age Group, 1964			12-17 Age Group, 1968		
Annual Family Income	Physical	Mental	Speech	Physical	Mental	Speech
≦$ 3,000	4.17%	7.02%	7.49%	0.38%	5.23%	2.36%
3,000-4,999	2.63	6.41	7.23	1.01	4.03	1.56
5,000-6,999	2.82	4.24	5.81	1.04	3.72	0.73
7,000-9,999	2.68	3.51	4.92	0.68	1.69	0.55
10,000-14,999	1.53	2.55	6.76	0.61	0.92	1.31
≧ 15,000	1.71	2.99	4.33	0.22	1.06	0.59

Source: Data from NCHS, 1975

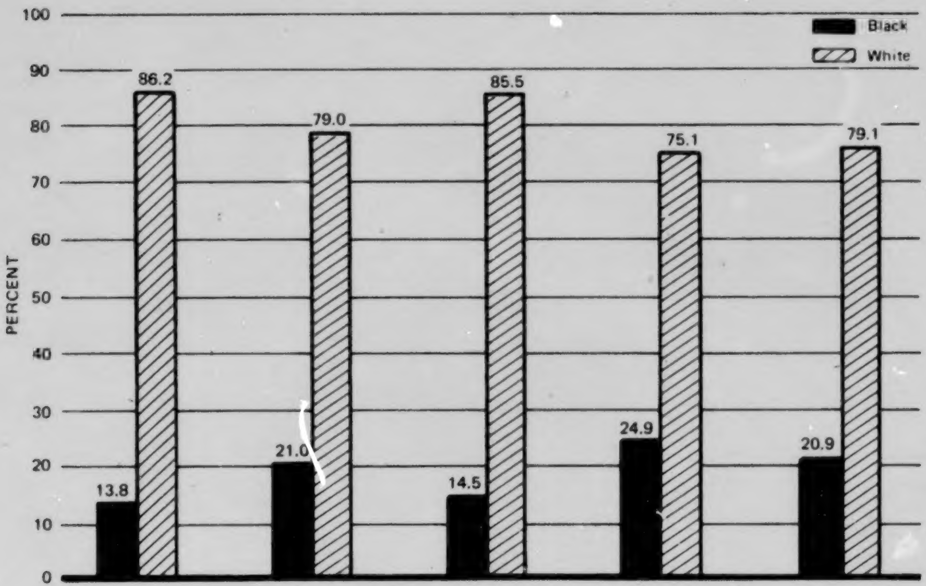
Multiple factors, both social and environmental, might account for these differences in teacher-identified needs for special services. For example, it is known that a higher incidence of poor nutrition and lead poisoning exists among children from low-income than from middle- and high-income families. Either of these conditions can cause mild to severe brain damage, resulting in mental retardation. There are also at least two additional, more elusive factors behind the higher rates reported for the low-income population. First, as revealed in recent controlled studies, when all factors except family income are held constant, persons in lower socioeconomic positions are far more likely to be identified by diagnostic experts as mentally retarded than those in middle and higher income groups (Anderson and Clark, 1974; Pueschel, 1974; Kotok, 1972). A second possibility is a similar unintended bias among teachers and other school personnel in identifying students as handicapped. Students who do not conform to expected and sometimes narrow behavior and achievement norms may be misidentified as requiring special services for the mentally handicapped. Thus, the higher rates of need reported by teachers for low-income groups may result in part both from substantive environmental factors which actually produce a higher incidence of handicaps and from misclassification.

The differences found in these data can be assessed from two viewpoints: in terms of their statistical significance, and in terms of their impact on policy. While statistical tests indicate a high probability that these patterns in identified handicaps would be found if the survey were repeated, their magnitude, and therefore their policy significance, may be somewhat exaggerated by misclassification.

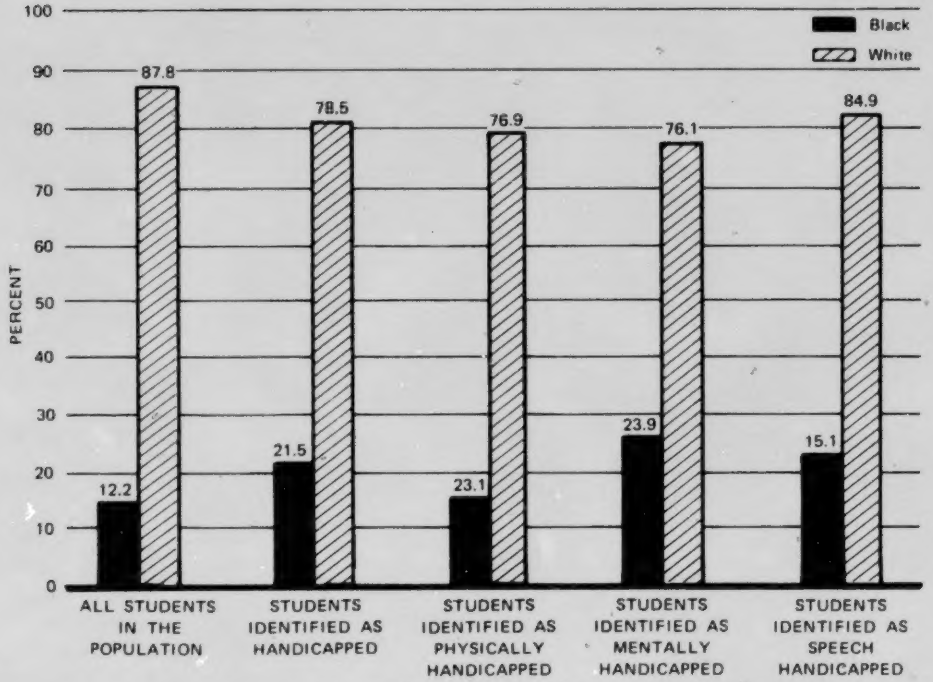
Race

On the basis of the summary data supplied by NCHS, the only racial or ethnic distinction that could be made in this analysis was between black and white students. Although the data included a category labeled "Other," the sample size for each handicap was far too small to provide significant comparisons.

The distribution of teacher-identified handicapped students by race is presented in the same way as the distribution by family income. Figure 2(a) shows the proportions of students aged 6 to 11 in each handicap group and in the total age group population that are black and white; Figure 2(b) presents these data for students aged 12 to 17. For these

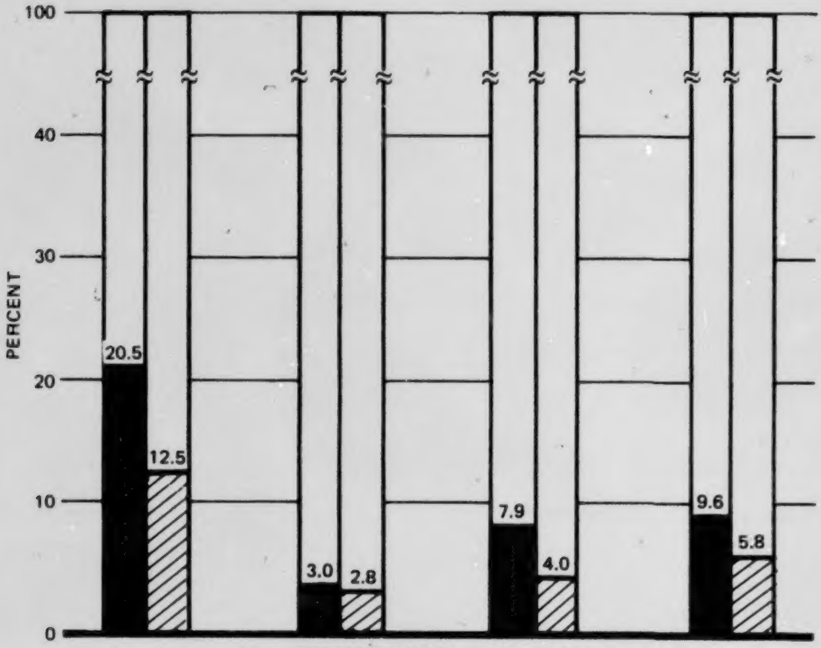


(a) STUDENTS AGED 6 TO 11 (1964)

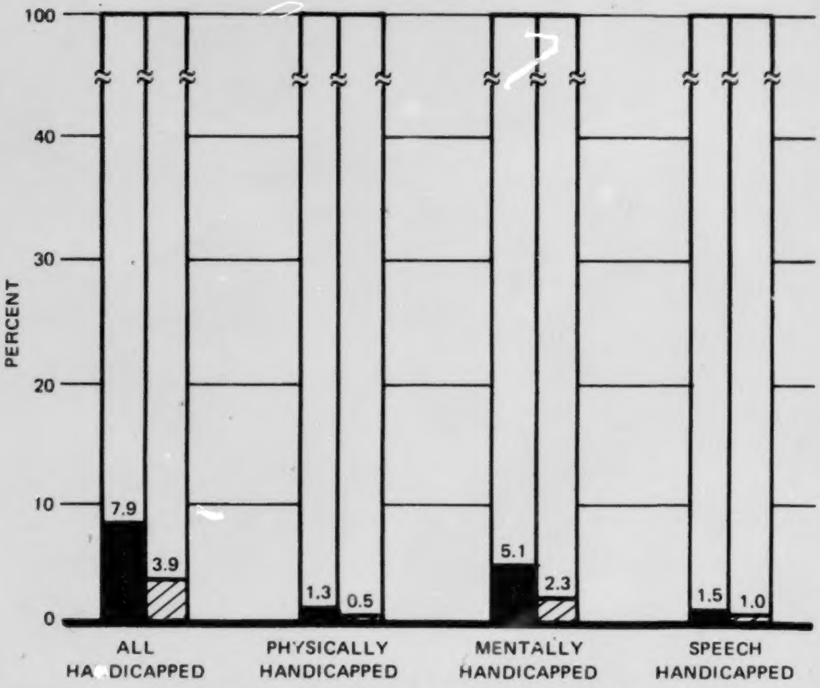


(b) STUDENTS AGED 12 TO 17 (1968)

FIGURE 2 PERCENTAGE, BY RACE, IN THE TOTAL POPULATION COMPARED TO PERCENTAGE, BY RACE, OF TEACHER-IDENTIFIED HANDICAPPED STUDENTS (PERCENTAGE OF TOTAL AGE GROUP)



(a) STUDENTS AGED 6 TO 11 (1964)



(b) STUDENTS AGED 12 TO 17 (1968)

■ % Handicapped of total Black population

▨ % Handicapped of total White population

FIGURE 3 PROPORTION TEACHER-IDENTIFIED HANDICAPPED IN EACH RACE GROUP (PERCENTAGE OF TOTAL RACE GROUP)

two age levels each handicap group is plotted against the total student population by race.

Figure 3 shows, within each race and handicap group, the percentage of students identified by teachers as needing these special services. Again, (a) and (b) shows the data for the 6 to 11 and 12 to 17 age groups respectively.

As illustrated by Figures 2 and 3, there is a marked concentration of identified handicaps in the black student population. Although there has been an increased sensitivity to identification issues since the time of the NCHS survey, a recent report (1975) by the Children's Defense Fund (CDF) suggests that the patterns presented here still exist throughout the country. Figures reported by CDF for five southern states and other selected school districts are reproduced in Tables 4 through 6. The tables compare total school population in classes for the mentally retarded with minority group enrollments. The differences are dramatic.

In the five southern states blacks were enrolled three to five times more frequently than whites relative to their proportions in the total school population. The greatest difference was found in Georgia, where blacks make up 36.8% of the total school population, yet constitute almost 75% of the enrollment of classes for the mentally retarded. Whites, on the other hand, represent 62.9% of the total school population but only 28% of the enrollment in classes for the mentally retarded. These racial disparities cited by CDF do not seem to be limited to the South. In Denver, Colorado, for example, where blacks make up 17.8% of the total school population, their enrollment in EMR-EMH (Educable Mentally Retarded-Educable Mentally Handicapped) classes is 33.4% of the total. The Spanish population comprises 24.1% of the total population, but 38.3% EMR-EMH enrollment. These rates compare to those found in the NCHS data for black students identified as needing services for the mentally retarded. They

Table 4

STUDENTS ENROLLED IN EDUCABLE MENTALLY RETARDED (EMR) CLASSES, BY RACE, IN FIVE SOUTHERN STATES, 1973

	Total Student Enrollment				Enrollment in EMR Classes				EMR Class Enrollment (percentage of total enrollment)			
State	White	Black	Other	Total	White	Black	Other	Total	White	Black	Other	Total
Alabama	478,568 (66.0)*	245,588 (33.9)	1,209 (0.2)	725,365	6,985 (41.6)	9,807 (58.4)	7 (0.04)	16,799	1.5	4.0	0.6	2.3
Arkansas	142,704 (59.9)	94,889 (39.8)	615 (0.3)	238,208	1,381 (28.6)	3,443 (71.3)	6 (0.1)	4,830	1.0	3.6	1.0	2.0
Georgia	591,194 (62.9)	345,508 (36.8)	3,190 (0.3)	939,892	6,498 (28.0)	16,672 (71.8)	36 (0.2)	23,206	1.1	4.8	1.1	2.4
Mississippi	210,352 (48.2)	224,952 (51.6)	868 (0.2)	436,172	1,740 (23.1)	5,798 (76.9)	5 (0.1)	7,694	0.8	2.6	0.6	1.8
South Carolina	312,651 (57.7)	228,002 (42.0)	1,620 (0.3)	542,273	3,964 (25.5)	11,571 (74.4)	20 (0.1)	15,555	1.3	5.1	1.2	2.9

---

*Percentage of total enrollment given in parentheses.

Source: Data from Children's Defense Fund, Washington Research Project, Incorporated, 1975

Table 5

STUDENTS ENROLLED IN EDUCABLE MENTALLY RETARDED (EMR) AND EDUCABLE MENTALLY HANDICAPPED (EMH) CLASSES, BY RACE, IN FIVE SCHOOL DISTRICTS, FALL 1973

	Total Student Enrollment						Enrollment in EMR/EMH Classes				
State/District: School District	White	Black	Spanish Surname	American Indian	Asian	Total	White	Black	Spanish Surname	Other	Total
District	4,333	129,248	837	20	641	135,079	0	87	0	0	87
of Columbia*	(3.2)†	(95.7)	(0.6)	(0.0)	(0.5)						
Colorado:	49,892	15,584	21,104	371	669	87,620	453	545	624	9	1,631
Denver	(56.9)	(17.8)	(24.1)	(0.4)	(0.8)		(27.8)	(33.4)	(38.3)	(0.5)	
Alabama:	19,217	17,030	19	4	23	36,293	191	809	0	2	1,002
Montomery	(52.9)	(46.9)	(0.1)	(0.0)	(0.1)		(19.1)	(80.7)	(0.0)	(0.2)	
South Carolina:	14,028	20,112	26	4	24	34,194	168	553	0	0	721
Richland County (No. 1)	(41.0)	(58.8)	(0.1)	(0.0)	(0.1)		(23.3)	(76.7)	(0.0)	(0.0)	
Georgia:	14,576	15,244	7	3	10	29,840	192	486	0	0	678
Bibb County	(48.8)	(51.1)	(0.0)	(0.0)	(0.0)		(28.3)	(71.7)	(0.0)	(0.0)	
Massachusetts:	19,218	7,521	2,805	19	65	29,628	138	128	74	0	340
Springfield	(64.9)	(25.4)	(9.5)	(0.1)	(0.2)		(40.6)	(37.6)	(21.8)	(0.0)	

---

*No percentage of EMR/EMH enrollment available; most children identified as needing special help are reported in one category.

†Percentage of total enrollment given in parentheses.

Source: Data from Children's Defense Fund, Washington Research Project, Incorporated, 1975

Table 6

STUDENTS ENROLLED IN EDUCABLE MENTALLY RETARDED/EDUCABLE MENTALLY HANDICAPPED (EMR/EMH) CLASSES, BY RACE, IN FIVE SCHOOL DISTRICTS, FALL 1973
(Percentage of Total Enrollment of Each Group)

State/District: School District	Enrollment			
	White	Black	Spanish	Total
District of Columbia*				
Colorado:				
Denver	0.9%	3.5%	2.9%	1.9%
Alabama:				
Montgomery	1.0	4.8		2.8
South Carolina:				
Richland County (No. 1)	1.2	2.7		2.1
Georgia:				
Bibb County	1.3	3.2		2.3
Massachusetts:				
Springfield	0.7	1.7	2.6	1.1

---

*No percentage of EMR/EMH enrollment available; most children needing special help are reported in one category.

Source: Data from Children's Defense Fund, Washington Research Project, Incorporated, 1975

were identified over three-and-one-half times more frequently than their white classmates.

It is not currently possible to determine the extent to which such differences either reflect misclassification or are associated with environmental factors. This is a question, however, of considerable importance and will be considered in our future work. An analysis performed by comparing NCHS multi-assessment data with teacher identifications will be reported in Volume II.

Geographic Region

The distribution of identified handicaps across geographic areas, while exhibiting some regional variations, does not suggest any obvious statistical trends or policy relevant patterns. Because no uniform differences were found, the statistically significant comparisons are not presented here but are shown in Appendix B, Figure B-1.

Population Size of Place of Residence

Figure 4 presents the only highly significant trend in the distribution of identified handicaps by population size of place of residence. In the 12 to 17 age group, the rates of teacher-identified emotional disturbance rise clearly with increasing city size. In our subsequent analysis of the complete NCHS data, we may be able to suggest explanations for this variation.

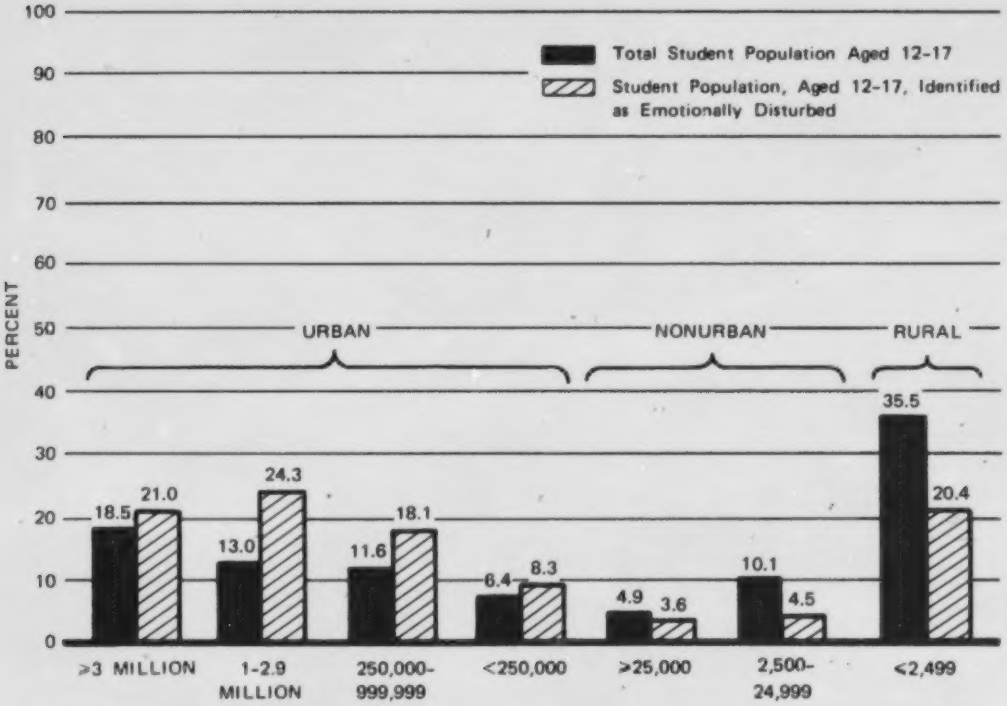


FIGURE 4 DISTRIBUTION, BY POPULATION SIZE OF PLACE OF RESIDENCE, OF TEACHER-IDENTIFIED EMOTIONALLY DISTURBED STUDENTS, AGED 12 TO 17 (PERCENTAGE OF POPULATION GROUP, 1968)

CONCLUSIONS

There are six primary findings of this analysis:

- All three types of teacher-identified handicaps (physical, mental, and speech) are significantly concentrated in the low-income elementary school population.
- Among secondary school students, the incidence of teacher-identified mental and speech handicaps increases with diminishing family income; physical handicaps show much less of this tendency.
- Teachers identify both mental and speech handicaps at a significantly more frequent rate for black than white elementary school children.
- For secondary school students, the only teacher-identified handicap reported significantly more frequently for blacks than whites is mental retardation.
- For the demographic dimension of city size, the only significant finding is a rise in rates of teacher-identified emotional disturbance among 12 to 17 year olds with the increase of city size from rural to urban.
- Although there are regional differences in teacher-identified handicaps, they are somewhat puzzling and do not suggest a definite pattern.

The definitions and population characteristics based on teacher-identification of special need developed in this volume are a first step in providing information which could lead to more effective targeting of federal handicap funds and to the development of more appropriate federal guidelines for implementation. Until state reporting of handicapped populations is both more accurate and nationally comparable, there will be a crucial need for an alternative method to project estimated handicap prevalence rates for each state. Such estimates are needed not only for establishing policy and developing alternative support and service approaches, but also for program implementation, enforcement, and monitoring.

A question with direct bearing on formulating policy and funding strategies is whether systematic identification patterns exist. Such patterns might indicate need to drop the current assumption that handicaps are distributed evenly between the elementary and secondary school populations and uniformly across socioeconomic and demographic variables, and to more carefully tailor fund targeting for handicapped students.

It is not possible to conclude that the patterns of teacher-identified handicaps reported here represent true handicap prevalence rates. An objective of our second study, which will be reported in Volume II, is to establish a population profile by evaluating the NCHS clinical assessments and developmental histories, and by comparing teacher evaluations with them. However, although there may be a change in prevalence rates, we do not expect that the underlying patterns described in this volume will change appreciably. In addition, the rates reported here represent reliable data on teachers' perceptions of special need, and on this basis are important. They provide significant new information on the characteristics of children identified by the schools as requiring special education services. This information contradicts previous assumptions about handicapped students.

Appendix A

METHODOLOGY

Appendix A

METHODOLOGY

Data Source

The data source for the analysis of handicapped populations was a set of unpublished tabulations of results of Cycles II and III of the Health Examination Survey conducted by the National Center for Health Statistics (NCHS). At EPRC's request NCHS made cross-tabulations of original data from its multistage, stratified probability samples of clusters of households in land-based segments of the United States (NCHS, May 1974, p. 42).* Graphs based on these tabulations appear in Appendix B. Cycle II, conducted from July 1963 through December 1965, examined 7,417 noninstitutionalized children 6 to 11 years of age (NCHS, February 1972, p. 71), while Cycle III, conducted from March 1966 through March 1970, examined 6,768 noninstitutionalized married and single youth 12 to 17 years of age (NCHS, May 1974, p. 43). Each probability sample contained approximately 1,000 individuals in each age cohort in 25 different states. The samples were selected in cooperation with the Bureau of the Census so that weights could be used to inflate the data collected and characterize the larger universe (the continental U.S. population of which the sample subjects are representative). The adjusted final sample estimates of population agreed exactly with independent controls prepared by the Bureau of the Census for the noninstitutional population of the United States as of the midpoint of each NCHS survey by race and sex for each single year of age (6 to 11 for Cycle II, 12 to 17 for Cycle III; NCHS,

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*References appear at the end of Appendix A.

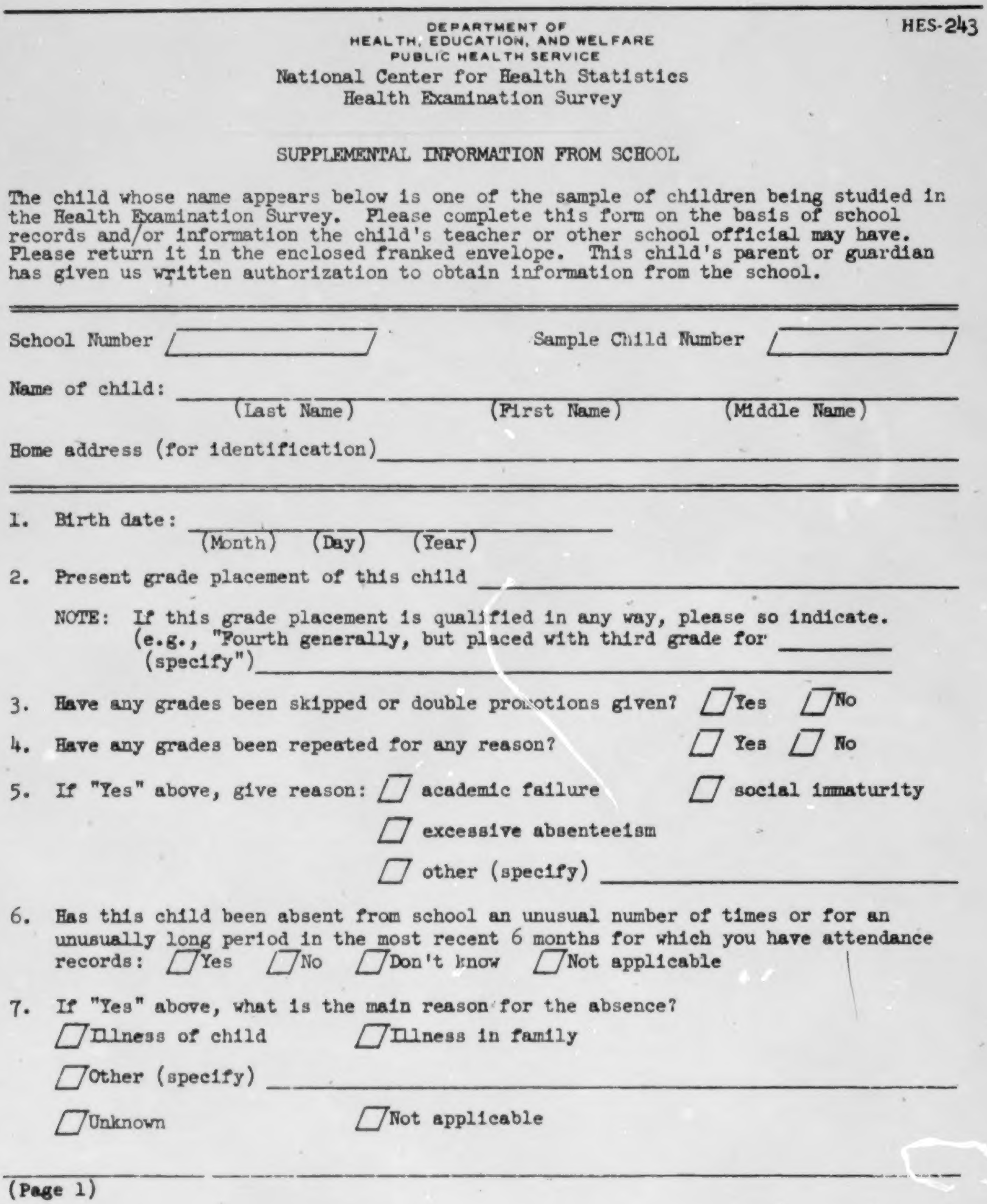
May 1974, p. 43). A comprehensive description of the survey plan, sample design, and examination content of each cycle has been published (NCHS, October 1967; NCHS, September 1969).

The survey data examined in this study were based on responses from self administered questionnaires (Figures A-1 and A-2) from teachers or others with sufficient knowledge to give an adequate rating of the individuals being examined. Public, parochial, and private schools were included in the survey. The responses of interest were ratings by teachers (or other school personnel where necessary) of individual subjects' needs for special-education services for handicaps of hearing, vision, speech, orthopedics, mental retardation, and emotional disturbance.

Only those criteria appearing in the questionnaires (Figures A-1 and A-2) were provided to respondents for classifying handicap problems or needs for services. In subsequent work on NCHS data, the validity and reliability of these ratings will be checked by comparing them with the medical and psychological findings also collected by NCHS on each subject.

Questions of reliability and nonresponse in the ratings data from teachers (or other school personnel), as well as more information on survey design, are discussed in the NCHS references listed at the end of this Appendix. Careful controls appear to have minimized biases and nonsampling errors. A response rate of 96% was achieved in Cycle II and 92% in Cycle III. Only 0.7% of the examinees in Cycle II (47 of the 7,119 children) did not attend school and thus were not rated by teachers (NCHS, February 1972, p. 2). This statistic is of some independent interest in light of recent controversy over the exclusion of children from public education. The largest potential source of nonsampling errors is a 13% nonresponse rate for youths 16 to 17 years of age, but no obvious effects of unreporting were observed (NCHS, May 1974, p. 45), and the bias over the 12 to 17 year old group is likely to be quite small.

FIGURE A-1 ELEMENTARY SCHOOL QUESTIONNAIRE



DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE
PUBLIC HEALTH SERVICE
National Center for Health Statistics
Health Examination Survey

HES-243

SUPPLEMENTAL INFORMATION FROM SCHOOL

The child whose name appears below is one of the sample of children being studied in the Health Examination Survey. Please complete this form on the basis of school records and/or information the child's teacher or other school official may have. Please return it in the enclosed franked envelope. This child's parent or guardian has given us written authorization to obtain information from the school.

School Number ☐ Sample Child Number ☐

Name of child: ____________ (Last Name) ____________ (First Name) ____________ (Middle Name)

Home address (for identification) ____________

1. Birth date: ____________ (Month) (Day) (Year)

2. Present grade placement of this child ____________

NOTE: If this grade placement is qualified in any way, please so indicate. (e.g., "Fourth generally, but placed with third grade for ________ (specify") ____________

3. Have any grades been skipped or double promotions given? ☐ Yes ☐ No

4. Have any grades been repeated for any reason? ☐ Yes ☐ No

5. If "Yes" above, give reason: ☐ academic failure ☐ social immaturity
☐ excessive absenteeism
☐ other (specify) ____________

6. Has this child been absent from school an unusual number of times or for an unusually long period in the most recent 6 months for which you have attendance records: ☐ Yes ☐ No ☐ Don't know ☐ Not applicable

7. If "Yes" above, what is the main reason for the absence?
☐ Illness of child ☐ Illness in family
☐ Other (specify) ____________
☐ Unknown ☐ Not applicable

(Page 1)

8. If the following special resources were available, check those you would recommend for this child:

   a. ☐ Special provision for hard of hearing.

   b. ☐ Special provision for "sight saving".

   c. ☐ Speech therapy.

   d. ☐ Special provision for orthopedically handicapped.

   e. ☐ Special provision for gifted children.

   f. ☐ Special provision for "slow learners".

   g. ☐ Class for mentally retarded.

   h. ☐ Special provision for emotionally disturbed.

   i. ☐ Other (specify) ____.

   j. ☐ None of above.

9. If you have checked any of the above items "a" thru "i", are the particular resources checked available for this child?
☐ Yes (If several checked, specify which available: ____________________)
☐ No ☐ Not applicable

10. If "Yes" above, are those resources being used by the child? ☐ Yes ☐ No
If "Yes" in item 9, but "No" in 10, what is the reason? ________________
____.

11. Which one of these statements most accurately describes this child?

   ☐ A. His adjustment is at times a concern. You think of him as a problem or future problem.
   ☐ B. Unusual in his ability to cope with normal situations. At least occasionally have thought of him as "unusually well adjusted."
   ☐ C. You rarely think of him in terms of his behavior. He is not described by A or B.

12. As you know, the ability to pay attention to a task and to sustain attention (concentrate) changes with age, although children of the same age differ. Check the item which best describes the child in the classroom situation.

   ☐ A. Pays attention as well as most children his age.

   ☐ B. Characteristically is more attentive than others his age.

   ☐ C. Characteristically is less attentive than others his age.

   ☐ D. No basis for judging which of above fits this child.

13. In the classroom situation which one of these statements most nearly describes this child?

☐ A. Almost constantly moving, inappropriately talks out loud, drops things, leaves his seat when he should not, finds reasons to be "on-the-move".

☐ B. Slightly more restless than most children his age. But usually is not a problem in the classroom.

☐ C. Shows average amount of restlessness if fatigued, bored, etc. Motor activity level is as expected for his age.

☐ D. Remains quiet long after the average child has become restless. Sometimes seems too controlled for his age.

☐ E. No basis for judging which of above fits this child.

14. Below are a list of statements which may or may not describe this child. If the statement is descriptive of him/her, place a check mark (✓) in front of the statement. If it does not describe this child, leave the space blank. (You may check several items).

☐ A. Other children frequently accuse him of fighting.
☐ B. "Accidentally" trips, shoves or hits other children. Is too "rough" with other children.
☐ C. Frequently comes to your attention because he has been injured.
☐ D. Agressive behavior frequently makes disciplinary action necessary.
☐ E. Children frequently complain that he uses bad words.
☐ F. Parents of other children call to complain about his behavior.
☐ G. No method of discipline seems to work with him.
☐ H. No basis for judging about this child in these areas.
☐ I. None of above statements describe this child.

15. How frequently is any specific disciplinary action required for this child?

☐ A. Frequently ☐ B. Occasionally

☐ C. Never ☐ D. No basis for judging which of above fits this child.

16. When children "choose sides" is this child usually

☐ A. Among the first few to be chosen.

☐ B. Neither among the first nor the last ones chosen.

☐ C. Almost always among the last ones chosen.

☐ D. Relationship to group so changeable you can't predict order in which he would likely be chosen.

☐ E. No basis for judging which of above fits this child.

17. When a leader is chosen by the group, is this child

☐ A. Chosen more frequently than the average child.

☐ B. Chosen about as often as the majority of the children.

☐ C. Almost never chosen.

☐ D. No basis for judging which of above fits this child.

18. With respect to intellectual ability, would you judge this child to be:

☐ A. About average for his age (neither in the top - about one-fourth, nor the bottom - about one-fourth)

☐ B. Clearly above average for his/her age (In about the top fourth).

☐ C. Clearly below average for his/her age (In about the bottom fourth).

☐ D. No basis for judging this child.

19. With respect to academic performance, would you judge this child to be:

☐ A. About average for his/her age (neither in the top - about one-fourth, nor the bottom - about one-fourth).

☐ B. Clearly above average for his/her age (In about the top fourth).

☐ C. Clearly below average for his/her age (In about the bottom fourth).

☐ D. No basis for judging this child.

20. How long have you (the person providing the above information) known this child?

☐ Less than one month.

☐ More than one but less than six months.

☐ More than six months but less than one year.

☐ More than one year.

21. In what capacity have you known this child?

☐ Teacher in classroom.

☐ Teacher in special area (specify) ______________________________

☐ School principal or assistant

☐ Other. (specify) ____

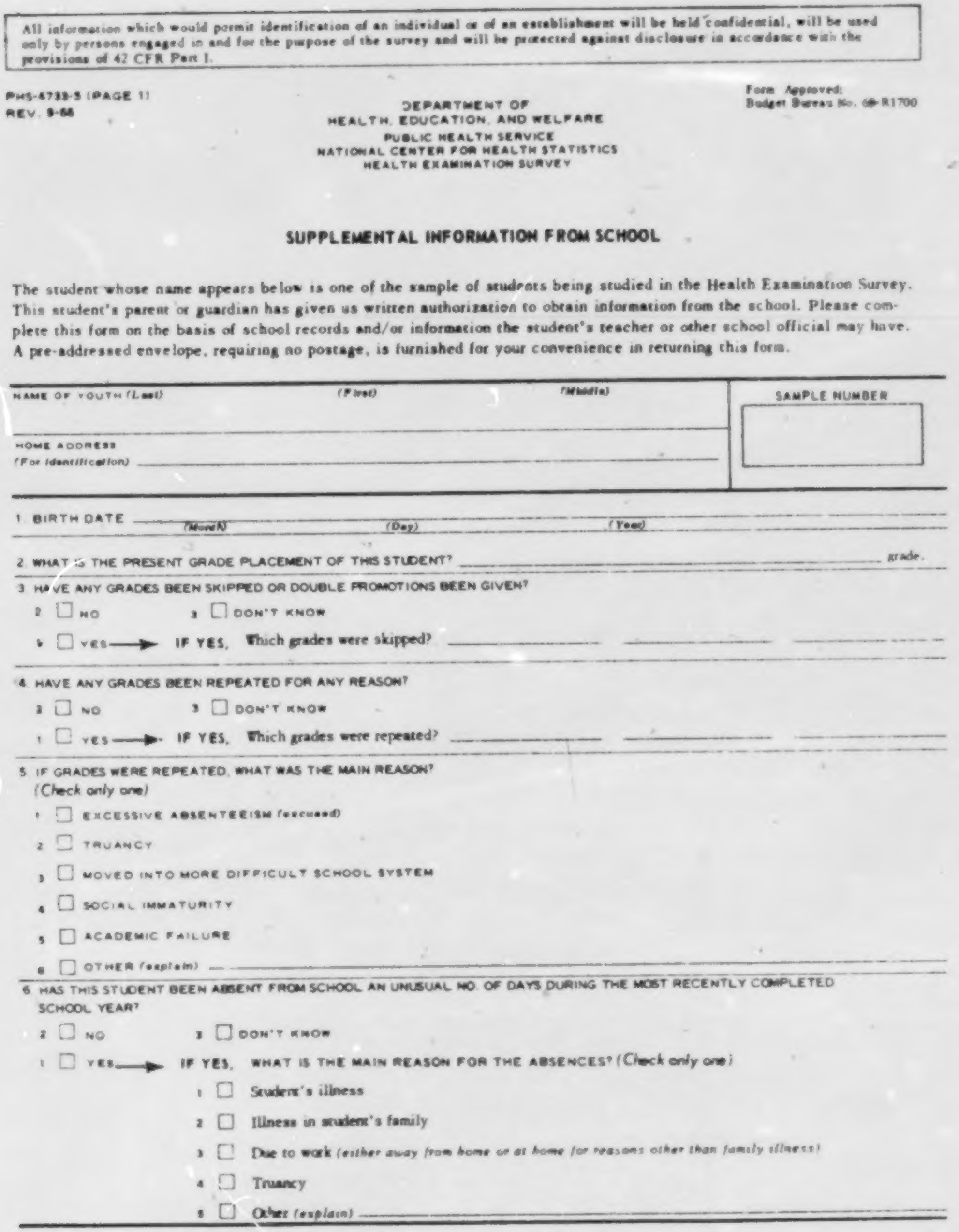
22. Name of respondent providing information on this child

____

____
(School)

23. Date completed ____________________

FIGURE A-2 SECONDARY SCHOOL QUESTIONNAIRE



All information which would permit identification of an individual or of an establishment will be held confidential, will be used only by persons engaged in and for the purpose of the survey and will be protected against disclosure in accordance with the provisions of 42 CFR Part 1.

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DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE
PUBLIC HEALTH SERVICE
NATIONAL CENTER FOR HEALTH STATISTICS
HEALTH EXAMINATION SURVEY

Form Approved:
Budget Bureau No. 68-R1700

SUPPLEMENTAL INFORMATION FROM SCHOOL

The student whose name appears below is one of the sample of students being studied in the Health Examination Survey. This student's parent or guardian has given us written authorization to obtain information from the school. Please complete this form on the basis of school records and/or information the student's teacher or other school official may have. A pre-addressed envelope, requiring no postage, is furnished for your convenience in returning this form.

NAME OF YOUTH *(Last)* *(First)* *(Middle)*

HOME ADDRESS *(For identification)*

SAMPLE NUMBER

1. BIRTH DATE *(Month)* *(Day)* *(Year)*

2. WHAT IS THE PRESENT GRADE PLACEMENT OF THIS STUDENT? ______ grade.

3. HAVE ANY GRADES BEEN SKIPPED OR DOUBLE PROMOTIONS BEEN GIVEN?

2 ☐ NO 3 ☐ DON'T KNOW

1 ☐ YES ⟶ IF YES, Which grades were skipped? ______ ______ ______

4. HAVE ANY GRADES BEEN REPEATED FOR ANY REASON?

2 ☐ NO 3 ☐ DON'T KNOW

1 ☐ YES ⟶ IF YES, Which grades were repeated? ______ ______ ______

5. IF GRADES WERE REPEATED, WHAT WAS THE MAIN REASON? *(Check only one)*

1 ☐ EXCESSIVE ABSENTEEISM *(excused)*
2 ☐ TRUANCY
3 ☐ MOVED INTO MORE DIFFICULT SCHOOL SYSTEM
4 ☐ SOCIAL IMMATURITY
5 ☐ ACADEMIC FAILURE
6 ☐ OTHER *(explain)* ______

6. HAS THIS STUDENT BEEN ABSENT FROM SCHOOL AN UNUSUAL NO. OF DAYS DURING THE MOST RECENTLY COMPLETED SCHOOL YEAR?

2 ☐ NO 3 ☐ DON'T KNOW

1 ☐ YES ⟶ IF YES, WHAT IS THE MAIN REASON FOR THE ABSENCES? *(Check only one)*

1 ☐ Student's illness
2 ☐ Illness in student's family
3 ☐ Due to work *(either away from home or at home for reasons other than family illness)*
4 ☐ Truancy
5 ☐ Other *(explain)* ______

7. HOW FREQUENTLY IS ANY SPECIFIC DISCIPLINARY ACTION REQUIRED FOR THIS STUDENT?

1 ☐ FREQUENTLY
2 ☐ OCCASIONALLY
3 ☐ NEVER
4 ☐ NO BASIS FOR JUDGING WHICH OF THE ABOVE FITS THIS STUDENT

8. ARE SPECIAL RESOURCES NEEDED OR CURRENTLY BEING USED FOR THIS STUDENT?

2 ☐ NO **(SKIP TO QUESTION 9)**
1 ☐ YES ——► IF YES, complete the following only for those special resources needed or currently being used by this youth:

SPECIAL RESOURCE	RESOURCE NEEDED *(Check one)*			REASON FOR NON-USE *(Check primary reason)*			
	BEING USED	NOT AVAILABLE	AVAILABLE BUT NOT USED	OVER-CROWDED	STUDENT OBJECTS	PARENTS OBJECT	OTHER *(specify)*
a. For the gifted							
b. For the mentally retarded							
c. For "slow learners" not classed as mentally retarded							
d. For emotionally disturbed							
e. For orthopedically handicapped							
f. Special facilities for the "hard of hearing"							
g. Special facilities for the visually handicapped							
h. Speech therapy							
i. Remedial reading							
j. English for students from non-english speaking environments							
k. Remedial training in special subject area(s)							
l. Other resources needed *(specify)*							

9. IN TERMS OF ADJUSTMENT, WHICH OF THE FOLLOWING BEST DESCRIBES THIS STUDENT?

1 ☐ SEEMS WELL ADJUSTED.
2 ☐ SEEMS SOMEWHAT MALADJUSTED.
3 ☐ SEEMS SERIOUSLY MALADJUSTED.
4 ☐ NO BASIS FOR JUDGING WHICH OF THE ABOVE FITS THIS STUDENT.

10. IN TERMS OF INTELLECTUAL ABILITY, WHICH OF THE FOLLOWING BEST DESCRIBES THIS STUDENT?

1 ☐ ABOVE AVERAGE
2 ☐ AVERAGE
3 ☐ BELOW AVERAGE
4 ☐ DON'T KNOW STUDENT WELL ENOUGH TO JUDGE.

11. IN TERMS OF ACADEMIC ACHIEVEMENT, IS THIS STUDENT:

1 ☐ IN THE UPPER THIRD OF HIS CLASS
2 ☐ IN THE MIDDLE THIRD OF HIS CLASS
3 ☐ IN THE LOWER THIRD OF HIS CLASS
4 ☐ DON'T KNOW → **IF DON'T KNOW,** *Specify reason* ____________________

12. IN TERMS OF POPULARITY WITH OTHER STUDENTS, IS THIS STUDENT:

1 ☐ ABOVE AVERAGE IN POPULARITY
2 ☐ ABOUT AVERAGE IN POPULARITY
3 ☐ BELOW AVERAGE IN POPULARITY
4 ☐ DON'T KNOW

13. HOW LONG HAVE YOU KNOWN THIS STUDENT?

1 ☐ LESS THAN ONE SEMESTER
2 ☐ MORE THAN ONE SEMESTER BUT LESS THAN ONE YEAR
3 ☐ MORE THAN ONE YEAR BUT LESS THAN TWO YEARS.
4 ☐ MORE THAN TWO YEARS

SIGNATURE OF PERSON COMPLETING THIS FORM

OFFICIAL TITLE	DATE FORM COMPLETED

Data Processing*

NCHS provided cross-tabulations and population estimates for Cycle II and Cycle III data (Roberts, NCHS, private communication, December 17, 1974). The following quantities were provided for each teacher-identified handicapping condition by age and sex, broken down separately by the variables of family income, race, region, and population size of place of residence:

(1) Sample totals of subjects for whom school data were obtained in each socioeconomic or demographic category.

(2) Sample totals of subjects in each category identified by teachers as needing a specific educational service.

(3) Population estimates, for the midpoint of each cycle, of the total number of subjects in each category for whom school data were available [obtained from sample totals in (1) by weighting].

(4) Population estimates, for the midpoint of each cycle, of the number of subjects in each category identified by teachers as needing a specific educational service [obtained from sample totals in (2) by weighting].

(5) Population estimates of rates per 100 subjects in each category needing specific educational services [quotient of (4) and (3)].

(6) Standard errors for rates per 100 subjects as given in (5).

From these tabulations for each age group, the authors constructed total rates and standard errors for three groups of teacher-identified handicapping conditions--physical, mental, and speech. The first two are sets of conditions. Physical handicaps consist of hearing, vision, and orthopedic problems. Mental handicaps consist of mental retardation and emotional disturbance. The rationale for these groupings is discussed in the main text.

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*The authors are grateful to Jean Roberts, Chief, Medical Statistics Branch Division of Health Examination Statistics, National Center for Health Statistics for her cooperation in supervising computer tabulations at NCHS.

The rate for each handicap group was considered the sum of the rates for the separate handicaps in that group. An individual reported to have two physical handicaps, for example, was counted twice. The resulting group rates, therefore, indicate the total number of handicaps per 100 students rather than the total number of individuals per 100 reported to have one or more handicap. The standard errors (SE) for these group rates equal the square root of the sum of the squares of the standard errors of the individual handicap rates included.

The principal research question was whether teacher reported rates differed significantly across family income, race, region, and population size of place of residence. Particular effort was directed toward detecting trends across the categories with a natural ordering--family income and population size of place of residence. The method of approach to these tasks is described below.

General Statistical Considerations

Low rates of identified handicaps found in our earlier examinations of NCHS data (Craig and McEachron, 1975) indicated it would be necessary to consolidate age-sex categories in each cycle to obtain meaningful estimates across various subpopulations. This is not considered a liability to the policy relevance of the analysis. Delivery of educational services is usually not differentiated by sex and is only generally dependent on age. Delivery is generally by educational level: elementary schools (modal age range 6 to 11 years, both sexes) and secondary schools (modal age range 12 to 17 years, both sexes). The shifts in age distribution (proportions of the 6 to 17 population at each year of age) of each cycle would affect the consolidated results if each survey were repeated, but the effects would be small in comparison to the sampling variability. Therefore, changes in age distribution within the 6 to 11 and 12 to 17 ranges were ignored. However, the absolute numbers of individuals needing special-education services [tabulations (4)] at the estimated rates would change far more substantially. As a result, the statistical analysis focused on the percentages of children (aged 6 to 11) and youths (aged 12 to 17) identified as needing specialized educational service rather than on absolute numbers.

The NCHS survey design and operation for each cycle was organized to minimize bias and variability of measurement techniques. The estimates of standard errors for the rates in tabulation (6) furnished by NCHS are primarily measures of sampling variability; these variations might occur by chance because only a sample of the population was surveyed. The standard error, as estimated for these tabulations and calculated by the authors for the physical and mental groups of handicaps, also reflects part of the variability arising in the measurement process. It does not include estimates of biases that might be in the data.

The level of significance used most frequently in this report is 5 in 100 ("$p < 0.05$"). Thus for results to be significant the chances must be less than 5 in 100 that they could arise from sampling and measurement variations alone.

Confidence Intervals for Individual Identified-Handicap Rates

A confidence interval for a sample rate in this report is an interval with a length and location that specifies the chance that, if the NCHS survey were repeated, the rate would lie within that interval. For example, if the random sampling and measurement variability reflected in the standard errors are approximately normally distributed, the chances are about 95 in 100 that a second survey would obtain a rate within plus or minus 1.96 standard errors of the estimated rate of the original survey. There would be only one chance in 40 that the second rate would lie above this interval, and one chance in 40 that the second rate would lie below the interval. Therefore, a single 95% confidence interval with equal chances that a second survey's estimate would lie above or below the interval would appear as a line segment centered on the estimated rate and extending 1.96 standard errors to either side.

The sampling and measurement variabilities reflected in the NCHS estimates of standard error are approximately normally distributed when five or more subjects in a subsample are identified as having a particular handicap (Hoel, 1971, p. 82). Since small rates in small subsamples occur frequently in the NCHS data, this condition is often violated. More accurate methods of determining confidence intervals could be developed from these data on the basis of the binominal distribution using procedures employed in the statistical tests described later. The calculation of confidence intervals is intended for illustration only, however, and therefore the normal approximation was used throughout.

Approximate confidence intervals for the rates of each handicapping condition identified for both age groups were constructed separately across the four socioeconomic and demographic dimensions. These are presented in Appendix B. A rule of thumb for the accuracy of such a confidence interval is that it not extend below zero; a rate below zero is impossible by definition, and therefore the normal approximation that suggests it must be in error. The correct confidence interval when this condition is violated is no longer symmetrical about the estimated rate but shifts upward (away from the zero rate boundary). In Figure A-3, the normal approximation for the single 95% confidence interval (the solid vertical line with bars on each end) extends below the zero percent boundary. The correct confidence interval, as interpolated from the Poisson distributions to yield a continuous approximation, extends considerably higher. The reader should keep this phenomenon in mind when examining the approximate intervals in Appendix B for small estimated rates.

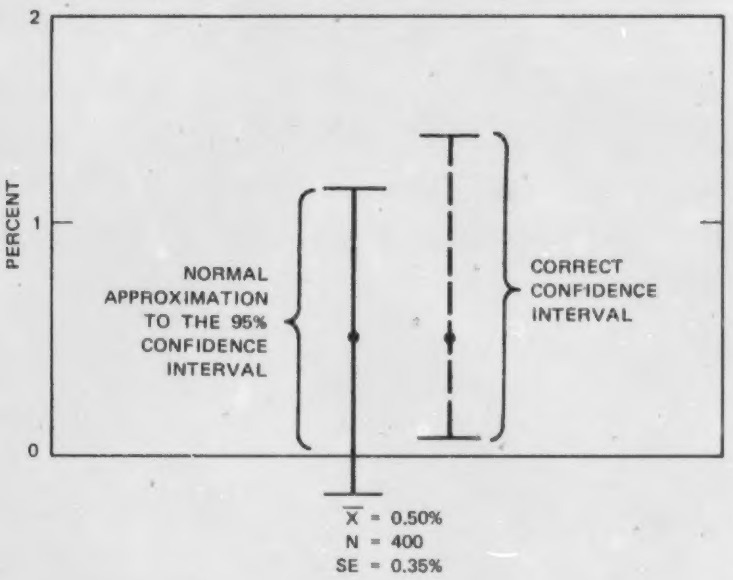

FIGURE A-3 AN EXAMPLE OF THE EFFECTS OF A SMALL SAMPLE ON CONFIDENCE INTERVALS OF ESTIMATED RATES

In actually computing the confidence intervals in Appendix B, the conceptual unit for which a 95% level of confidence was desired was not each individual independent rate but the collection of rates (one per category) appearing in each figure. If the confidence level for each individual rate were 95% and a figure contained k of these rates (k categories) which are statistically independent, there would be a $(0.95)^k$ chance that none of the k rates estimated from a second survey would lie outside its individual 95% confidence interval. For k = 6 categories, $(0.95)^k = 0.735$, which is much below the 0.95 value desired. A good approximation to confidence intervals having the desired property of 95% confidence for each figure as a whole can be obtained by drawing each individual interval with a level of confidence given by 1 - (.05/k). The chance that none of the k rates estimated from a second survey would lie outside intervals with this level of confidence is $[1 - (.05/k)]^k$, which ranges from 0.950 when k = 1 to 0.9512 when k is arbitrarily large. The confidence intervals plotted in Appendix B are joint confidence intervals based on this approximation (Dunn, 1961). There is at least a 95% chance for each figure in Appendix B that all the rates estimated from a second survey would fall inside the confidence intervals shown (bearing in mind their approximate character as shown in Figure A-3).

The confidence intervals of Appendix B indicate sampling and measurement variability in data but are not suitable for assessing the statistical significance of differences. Such assessments require the construction of specific statistical tests, as described in the following section.

Statistical Tests on Individual Identified-Handicap Rates

The statistical tests for this report were performed to detect handicaps in each age range for which the differences in teacher-reported rates across socioeconomic and demographic categories are due to true variations in teacher ratings rather than sampling and measurement variability inherent in the NCHS survey. Of particular interest to policy formulation and funding strategies is the possibility of systematic statistical patterns indicating that more carefully tailored approaches should replace the current strategies, which are based on the assumption that handicaps are distributed uniformly through the elementary and secondary school-age population.

Ideally, in investigating this policy question the effects of each of the four socioeconomic dimensions should be separated. The NCHS summary data used for this report did not permit this partitioning of variance (Newton and Spurrell, 1967, 1968) because only marginal totals for each dimension were given. However, our current work with the Cycle II data tape will permit this analysis for the elementary school population. In this first volume, the variation in rates is examined along each dimension without controlling for the remaining three (the marginal distributions along each dimension).

Specification of Hypotheses

Selection of the types of hypotheses to be tested concerning variation in identified group rates along a given dimension was a function of whether that dimension possessed a natural ordering by size. Racial and regional categories possess no natural ordering. For these dimensions the null hypothesis of equal rates was tested against the alternative hypothesis that the rates in various categories were not all equal, regardless of which categories had the higher rates.

A natural ordering by size does exist along the dimensions of family income and population size of place of residence. For these dimensions a narrower alternative hypothesis was drawn: a trend or simple ordering of rates exists along the dimension when its categories are ordered by size. Since there was no basis for choosing a functional form for trends either by family income or by population size of place of residence, we applied the following simple orders:

$$r_1 \geq r_2 \geq \ldots \geq r_n \tag{1a}$$

or

$$r_1 \leq r_2 \leq \ldots \leq r_n \quad . \tag{1b}$$

Here r_i is the rate for the subset of the population falling in the i^{th} category; the index i is in order of increasing category of size; and not all rates in (1a) or (1b) are equal.

It remained only to determine for each dimension whether the trend against which to test would be increasing or decreasing as size increased. The trend for family income was taken to be decreasing rates with increases in income [form (1a)], whereas the trend for population size of place of residence was considered unspecified [either form (1a) or form (1b), a two-sided trend hypotheses].

Construction of a Test Against Unequal Rates Without Trend

Rates correspond statistically to proportions. Thus the problem of testing the null hypothesis of equality among rates in k categories of a dimension against the alternative hypotheses of unequal rates corresponds to the classical problem of determining the statistical significance of the differences among k proportions (Hoel, 1971, pp. 237-240). However, the classical test (chi-square) assumes simple random sampling with the size of the sample in each category known, and this condition was not met in the complex design and estimation of sampling and measurement variance in the NCHS survey. On the other hand, the NCHS material does provide estimates of the proportion and the standard error (NCHS, April 1966). To apply the classical chi-square test of homogeneity among k proportions, it was necessary to determine, category by category, the sample size that would have produced the proportion and standard error obtained from NCHS data with simple random sampling (SRS). This SRS-equivalent sample size was obtained by inverting the asymptotic formula for the standard error of a proportion with known large sample size under SRS (Hogg and Craig, 1970, p. 187):

$$SE = \sqrt{\frac{p(1 - p)}{\tilde{n}}} \qquad (2)$$

where SE is the standard error, p is the proportion, and $\tilde{n}$ is the SRS sample size. Inversion of (2) yields:

$$\tilde{n} = \frac{p(1 - p)}{(SE)^2} \qquad (3)$$

for the equivalent SRS sample size. The equivalent number of occurrences of identified handicapping conditions in a sample size n is

$$\tilde{x} = p\,\tilde{n} \quad . \qquad (4)$$

The numbers $\tilde{n}$ and $\tilde{x}$ derived from NCHS data according to equations (3) and (4) were used in the classical chi-square test to determine the statistical significance of differences among the identified physical, mental, and speech rates along the dimensions of region (k = 4 categories) and race (k = 2 categories). (Zero rates for one regional category for reported vision and orthopedic handicaps in the 12 to 17 age group were treated using the method described in the next section.) The test for two categories corresponds to the ordinary two-tail test of differences in proportions. The category of "other" was omitted because it was too small for inclusion. These values of $\tilde{n}$ and $\tilde{x}$ had noninteger values, which were retained in this form in the computation of the chi-square statistic rather than rounded to integer values. This procedure increased the accuracy of the test (in terms of size) for small values of $\tilde{x}$. The results are reported in Appendix B. The test is accurate as long as the following condition holds for each category i (Hoel, 1971, pp. 229-230):

$$\tilde{p}_e \tilde{n}_i \geqq 5 \quad \text{where} \quad \tilde{p}_e \overset{d}{=} \frac{\sum_{j=1}^{k} x_j}{\sum_{j=1}^{k} n_j} \quad . \tag{5}$$

Here $\tilde{p}_e$ is the estimated rate under the null hypothesis, while $\tilde{p}_e \tilde{n}_i$ is the expected number in a sample of size $\tilde{n}$ under the null hypothesis. Where condition (5) was violated along the regional dimension, adjacent categories were combined by adding the values of $\tilde{n}$ and the values of $\tilde{x}$ until the condition was satisfied (Hoel, 1971, p. 230). For race, no combination of categories was possible; where condition (5) was violated the data were considered too limited to yield significant results.

Construction of a Test Against Unequal Rates with Trend

To test the null hypothesis of equal rates against the alternative hypothesis of a sample ordering or trend as shown in relations (1a) and (1b), a modification of the classical chi-square test which was developed by Bartholemew (Bartholemew, 1959, pp. 36-48; Bartholemew, 1959, pp. 328-335) and analyzed further by Barlow, Bartholemew, Bremner, and Brunk (Barlow et al., 1972) was employed. The most accessible account of this test is given in Fleiss (Fleiss, 1973, pp. 100-102).

The Bartholemew chi-square test for one- or two-sided simple orders was applied for each age range and identified handicap to the rates arrayed by categories of family income and population size of place of residence. Formulas (3) and (4) were used to compute $\tilde{n}$ and $\tilde{x}$ for each category with a nonzero sample rate. All racial and ten of twelve regional breakdowns had nonzero rates reported in every category for every handicap; in contrast, several of the income and population size of place of residence categories across the handicaps had no cases reported in the sample, and thus no proportions or estimate standard errors. In such a case several equivalent SRS sample sizes for the category were imputed, ranging from 0.5 to 1.5 times the actual sample size [tabulation (1)], to allow a check on the sensitivity of the conclusions of the test to the missing data. The nonzero imputed equivalent sizes were chosen to bracket the range of values of $\tilde{n}$ versus actual sample size observed in nearby categories with similar total numbers of subjects in actual sample totals. Results were considered significant when the test indicated significance for the imputed size bearing the same proportion to the actual size as occurred in adjacent categories having positive rates. These results are summarized in Tables B-1 through B-4 of Appendix B.

Critical values for the Bartholemew chi-square test for one-sided or two-sided simple orders (1a) and (1b) have been tabulated only for three and four categories (Barlow et al., 1972, pp. 359-362). To permit use of these tables or the two-category test of proportions for the data by family income (k = 6 categories) or population size of place of residence (k = 8 categories), a combination of adjacent categories by addition of $\tilde{n}$ values and $\tilde{x}$ values was carried out. Categories to be combined were selected on the basis of a sequential application of three criteria. Each of these criteria is independent of the rates of teacher-identified handicap among the different categories, as required for statistical validity (Hoel, 1971, p. 230).

The first criterion was satisfaction of condition (5) for the accuracy of the normal approximation under the null hypothesis. (In several instances this step left only two categories for a test of proportions.) If this criterion could not be satisfied by at least two separate categories (for example, vision and orthopedic handicaps along the population size of place of residence dimension), the data was considered too limited to yield significant trends. If several configurations survived this screening, those retained for further examination preserved the greater detail or number of separate categories at the low-income end of the family income scale and at each end of the population size of place of residence scale. The final selection for family income was the configuration with the most equal number of categories in each joint category or, if choice still remained, the configuration that achieved the most even distribution of $\tilde{p}_e\tilde{n}$ as defined in Equation (5) across the joint categories. Final choice for population size of place of residence was made on the basis of minimum consolidation of categories across the urban-nonurban boundary. Tables B-1, B-2, and B-4 of Appendix B include, respectively, the final consolidated categories for family income and population size of place of residence, and for region where necessary to satisfy conditions (5).

The examples in Table A-1 illustrate the selection procedure. In the first example [presented in Table A-1(a)], the effective null hypothesis rate $\tilde{p}_e$ is computed from Equation (5) to be $\tilde{p}_e = 0.0127$ (1.27%). The criterion (5) is $\tilde{p}_e \tilde{n}_i \geqq 5$, which can be cast in the form $\tilde{n}_i \geqq 5/\tilde{p}_e = 393.77$. Each category satisfies this first criterion. The second criterion, preserving maximum detail at the low-income end of the scale, indicates that categories 3 and 4 and categories 5 and 6 should be combined. The resulting configuration of four categories and joint rates for application of the Bartholemew chi-square test is as follows:

Income Range	<\$3,000	\$3,000-4,999	\$5,000-9,999	≧\$10,000
Revised Category No. (j)	1	2	3	4
Joint $\overset{\approx}{n}_j$	626.33	873.17	2,784.55	1,367.52
Joint $\overset{\approx}{x}_j$	13.97	13.01	33.13	11.66
Joint Rate $\overset{\approx}{r}_j$	2.23%	1.49%	1.19%	0.85%

In the second example [presented in Table A-1(b)], category 1 contains no entries; for this example half the actual sample size was chosen as the most reasonable estimate for $\tilde{n}_i$ based on adjacent category 2. This value is enclosed in brackets in Table A-1. The null hypothesis rate $\tilde{p}_e$ is 0.25%, yielding the criterion $\tilde{n}_i \geqq 2{,}016$. Only category 3 meets this test. Since categories 1 and 2 combined do not, they must be combined with adjacent category 3. The test cannot be met by categories 4 through 6; combining adjacent categories to meet the test results in a single joint category (4) + (5) + (6). Thus in this example the criterion (5) produces only two categories (and therefore a one-tail two-category test), as shown in the tabulation following Table A-1.

Table A-1

EXAMPLES OF CONSOLIDATION OF CATEGORIES IN TESTING FOR TRENDS

(a) Vision Handicaps in 6 to 11 Age Group, by Family Income

	<\$3,000	\$3,000-4,999	\$5,000-6,999	\$7,000-9,999	\$10,000-14,999	≥\$15,000
Category number (i)	1	2	3	4	5	6
Actual sample size	1,143	1,211	1,580	1,405	790	319
Rate (r_i)	2.23%	1.49%	1.11%	1.26%	1.18%	0.38%
Standard error (SE_i)	0.59%	0.41%	0.29%	0.29%	0.38%	0.26%
Effective size $(\tilde{n}_i)$	626.33	873.17	1,305.21	1,479.34	807.53	559.99
Effective frequency $(\tilde{x}_i)$	13.97	13.01	14.49	18.64	9.53	2.13

(b) Vision Handicaps in 12 to 17 Age Group, by Family Income

	<\$3,000	\$3,000-4,999	\$5,000-6,999	\$7,000-9,999	\$10,000-14,999	≥\$15,000
Category number (i)	1	2	3	4	5	6
Actual sample size	694	821	1,006	1,458	1,212	629
Rate (r_i)	0	0.47%	0.38%	0.18%	0.21%	0.09%
Standard error (SE_i)	0	0.35%	0.13%	0.11%	0.21%	0.09%
Effective size $(\tilde{n}_i)$	[347][*]	381.87	2,239.98	1,484.93	475.19	1,110.11
Effective frequency $(\tilde{x}_i)$	0	1.80	8.51	2.67	1.00	1.00

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[*] Inserted as effective sample size for zero observed rate (see text).

Income Range	<$7,000	≧$7,000
Revised Category No. (j)	1	2
Joint $\overset{\approx}{n}_j$	2,968.85	3,070.23
Joint $\overset{\approx}{x}_j$	10.31	4.67
Joint Rate $\overset{\approx}{r}_j$	0.35%	0.15%

The Bartholemew test for three or four ordered categories satisfying (5), or the one-tailed test used in the last example, was applied to these adjusted data for the null hypothesis of equal rates and the alternative hypothesis of decreasing rate with increasing income for the dimension of family income. The two-sided version of these tests was employed for the population size of place of residence dimension and its unspecified trend with increasing population. Since rural dollar incomes tend to be lower than urban incomes, these two hypotheses are interdependent for data tabulated on each dimension alone (tabulations of marginals). This illustrates the need for case-by-case data allowing control on each of these variables to disentangle the effects. We are now analyzing NCHS's original data tape of survey Cycle II and the results will be reported in Volume II.

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Appendix B

DETAILED TABLES AND FIGURES

Table B-1

BARTHOLEMEW CHI-SQUARE TEST FOR TREND OF DECREASING RATES WITH INCREASING FAMILY INCOME

(a) 6 to 11 Age Group

Handicap	Consolidated Categories of Family Income (dollars per year)	χ^2 Corrected for Trend Inversion	Bartholemew Significance Level
Hearing	<$ 5,000	4.62	0.05
	5,000 - 6,999		
	7,000 - 9,999		
	≧10,000		
Vision	<3,000	6.99	0.025
	3,000 - 4,999		
	5,000 - 9,999		
	≧10,000		
Orthopedic	<5,000	2.99[*]	0.05[*]
	≧5,000		
Mental retardation	<3,000	17.92	<<0.005
	3,000 - 6,999		
	7,000 - 9,999		
	≧10,000		
Emotional disturbance	<3,000	11.92	<<0.005
	3,000 - 4,999		
	5,000 - 9,999		
	≧10,000		
Speech	<3,000	5.08	0.05
	3,000 - 4,999		
	5,000 - 9,999		
	≧10,000		

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[*] Criterion that expected frequencies to be at least five leads to only two categories, for which the square of the Z value and the significance level for a one-tailed test of differences in proportions is given.

Table B-1 (Concluded)

BARTHOLEMEW CHI-SQUARE TEST FOR TREND OF DECREASING RATES WITH INCREASING FAMILY INCOME

(b) 12 to 17 Age Group

Handicap	Consolidated Categories of Family Income (dollars per year)	χ^2 Corrected for Trend Inversion	Bartholemew Significance Level
Hearing	< $ 7,000	2.75[*]	0.05[*]
	≧7,000		
Sight	<7,000	2.37[*]	0.06[*]
	≧7,000		
Orthopedic	<7,000	0.24[*]	ns[*][†]
	≧7,000		
Mental retardation	<3,000	43.02	<<0.005
	3,000 - 4,999		
	5,000 - 9,999		
	≧10,000		
Emotional disturbance	<3,000	11.92	<0.005
	3,000 - 4,999		
	5,000 - 9,999		
	≧10,000		
Speech	<3,000	12.65	<0.005
	3,000 - 4,999		
	5,000 - 9,999		
	≧10,000		

---

[*] Criterion that expected frequencies be at least five leads to only two categories, for which the square of the Z value and the significance level for a one-tailed test of differences in proportions is given.

[†] ns = not significant.

Table B-2

BARTHOLEMEW CHI-SQUARE TWO-WAY TEST FOR TREND, BY POPULATION SIZE OF PLACE OF RESIDENCE

(a) 6 to 11 Age Group

Handicap	Consolidated Categories for Population Size of Place of Residence	Trend Direction with Increasing Population Size of Place of Residence	χ^2 Corrected for Trend Inversions	Two-Tailed Bartholemew Significance Level
Hearing	Rural Other Nonurban Urban ≦2.99 million Urban ≧3 million	Increasing	1.59	ns[*]
		Decreasing	0.18	ns
Vision	Rural Other Nonurban Urban ≦2.99 million Urban ≧3 million plus	Increasing	0.56	ns
		Decreasing	0[†]	ns
Orthopedic	Rural Other Nonurban and Urban ≦2.99 million Urban ≧3 million	Increasing	0[†]	ns
		Decreasing	0.03	ns
Mental retardation	Rural Other Nonurban Urban ≦2.99 million Urban ≧3 million	Increasing	0[†]	ns
		Decreasing	1.54	ns
Emotional disturbance	Rural Other Nonurban Urban ≦2.99 million Urban ≧3 million	Increasing	0[†]	ns
		Decreasing	2.96	ns
Speech	Rural Other Nonurban Urban ≦2.99 million Urban ≧3 million	Increasing	3.47	ns
		Decreasing	0[†]	ns

---

[*] ns = not significant.

[†] Due to corrections for trend inversion (hypothesized ordering not obtained).

Table B-2 (Concluded)

BARTHOLEMEW CHI-SQUARE TWO-WAY TEST FOR TREND BY POPULATION SIZE OF PLACE OF RESIDENCE

(b) 12 to 17 Age Group

Handicap	Consolidated Categories for Size of Place of Residence	Trend Direction with Increasing Population Size of Place of Residence	χ^2 Corrected for Trend Inversion	Two-Tailed Bartholemew Significance Level
Hearing	Rural plus Other, Other Nonurban to 35% of 10-25 thousand Urban plus remainder of Other, Nonurban	Increasing	2.19[*]	ns[*,†]
		Decreasing	0[‡]	ns[‡]
Vision	[§]	na[**]	na	na
Orthopedic	[§]	na	na	na
Mental retardation	Rural Other Nonurban Urban ≦2.99 million Urban ≧3 million	Increasing	1.67	ns
		Decreasing	0.42	ns
Emotional disturbance	Rural Other Nonurban Urban ≦2.99 million Urban ≧3 million	Increasing	15.5	<0.01
		Decreasing	0[‡]	ns
Speech	Rural Other Nonurban Urban ≦2.99 million Urban ≧3 million	Increasing	0.55	ns
		Decreasing	0[‡]	ns

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[*] Criterion that expected frequencies be at least five leads to only two combined categories, for which the square of the Z value and the significance level for a one-tail test of difference in proportions is given.

[†] ns = not significant.

[‡] Due to corrections for trend inversion (hypothesized ordering not obtained).

[§] Could not obtain two combined categories having expected frequency of at least five.

[**] na = not applicable.

Table B-3

PEARSON CHI-SQUARE TEST FOR DIFFERENCES IN IDENTIFIED RATES, BY RACE

	6-11 Age Group		12-17 Age Group	
Handicap	χ^2	Significance Level	χ^2	Significance Level
Hearing	0.24	ns[*]	[†]	na
Vision	0.88	ns	[†]	na
Orthopedic	[†]	na[‡]	[†]	na
Mental retardation	27.03	$<<0.001$	22.36	$<<0.001$
Emotional disturbance	9.36	0.005	0.21	ns
Speech	4.77	0.05	0.61	ns

Note: The chi-square test for two categories (one degree of freedom) is equivalent to a two-tail test of differences in proportions.

[*] ns = not significant.

[†] Criterion that expected frequencies to be at least five is not fulfilled for the black subsample.

[‡] na = not applicable.

Table B-4

PEARSON CHI-SQUARE TEST FOR DIFFERENCES IN IDENTIFIED RATES, BY REGION

Handicap	6-11 Age Group Regional Category	χ^2	Significance Level	Ordering of Regions	12-17 Age Group Regional Category	χ^2	Significance Level	Ordering of Regions
Hearing	N, MW, S, W[*]	10.15	0.02	MW > N > S > W	†	na[‡]	na	na
Vision	N, MW, S, W	13.96	<0.01	S > N > MW > W	N + MW, S + W[§]	8.40	<0.01	N + MW > S + W
Orthopedic	N, S, MW + W[§]	3.72	ns[**]	na	†	na	na	na
Mental retardation	N, MW, S, W	0.77	ns	na	N, MW, S, W	2.69	ns	na
Emotional disturbance	N, MW, S, W	4.58	ns	na	N, MW, S, W	1.08	ns	na
Speech	N, MW, S, W	0.35	ns	na	N, MW, S, W	6.60	0.10	S > MW > N > W

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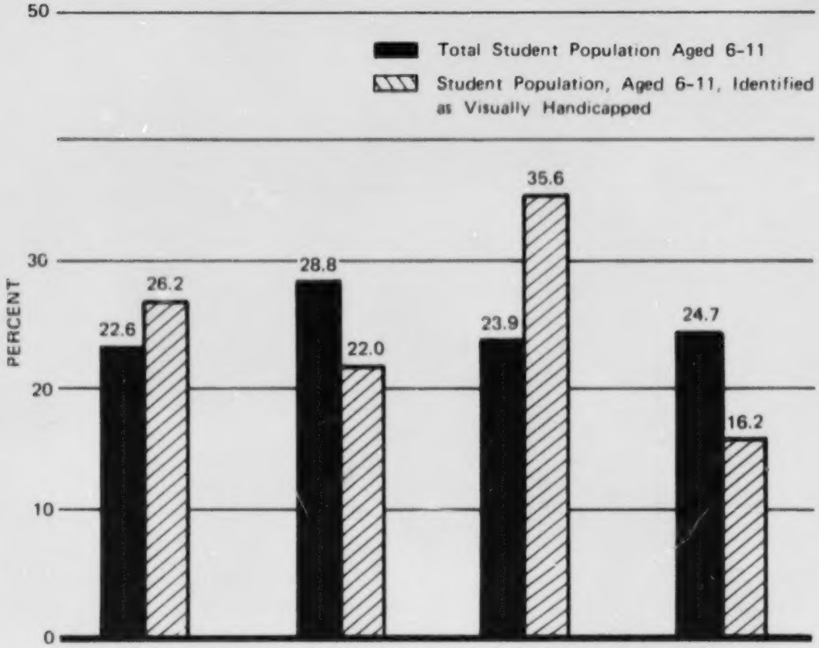
[*] N: North; MW: Midwest; S: South; W: West.

[†] No combination of categories could meet the criterion that expected frequencies be at least five.

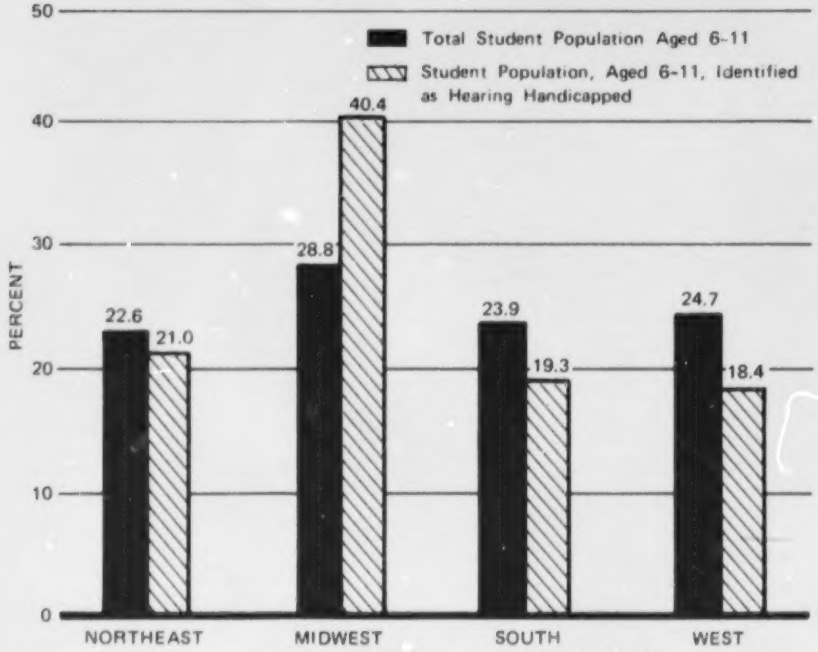
[‡] na = not applicable.

[§] Categories consolidated to meet expected frequency criterion.

[**] ns = not significant.

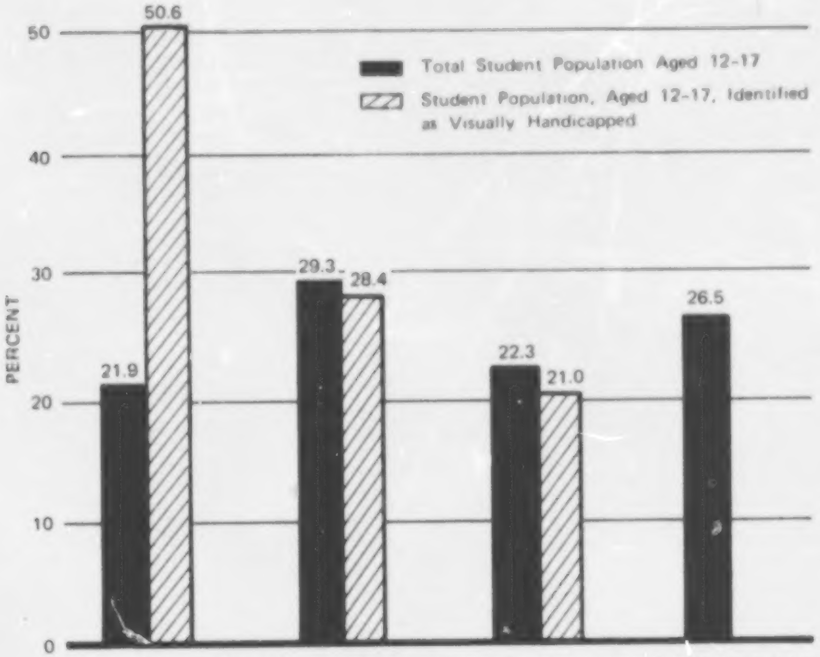


(a) TEACHER-IDENTIFIED VISUALLY HANDICAPPED STUDENTS AND ALL STUDENTS, AGED 6 TO 11

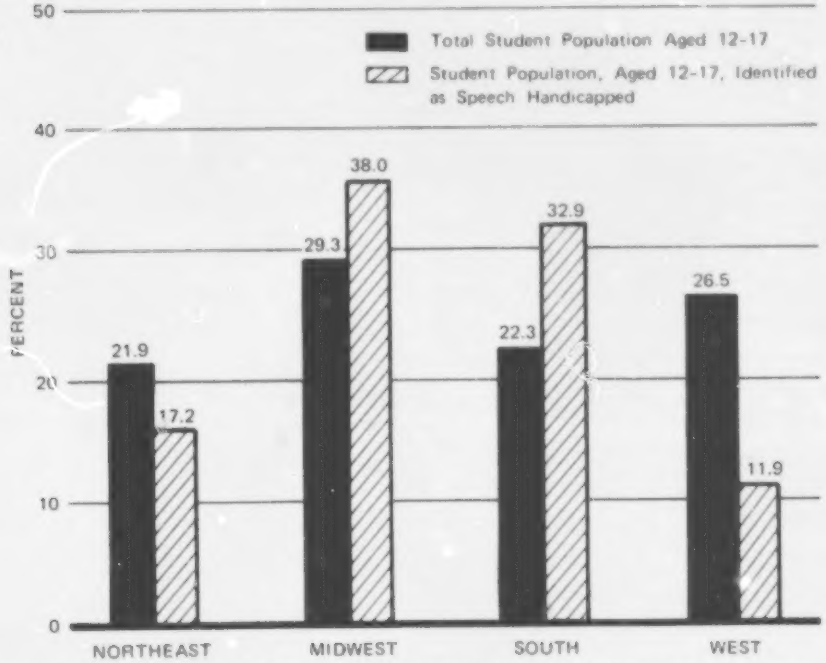


(b) TEACHER-IDENTIFIED HEARING HANDICAPPED STUDENTS AND ALL STUDENTS, AGED 6 TO 11

FIGURE B-1 DISTRIBUTION, BY GEOGRAPHIC REGION, OF TEACHER-IDENTIFIED HANDICAPPED STUDENTS (PERCENTAGE OF POPULATION GROUP, 1964)

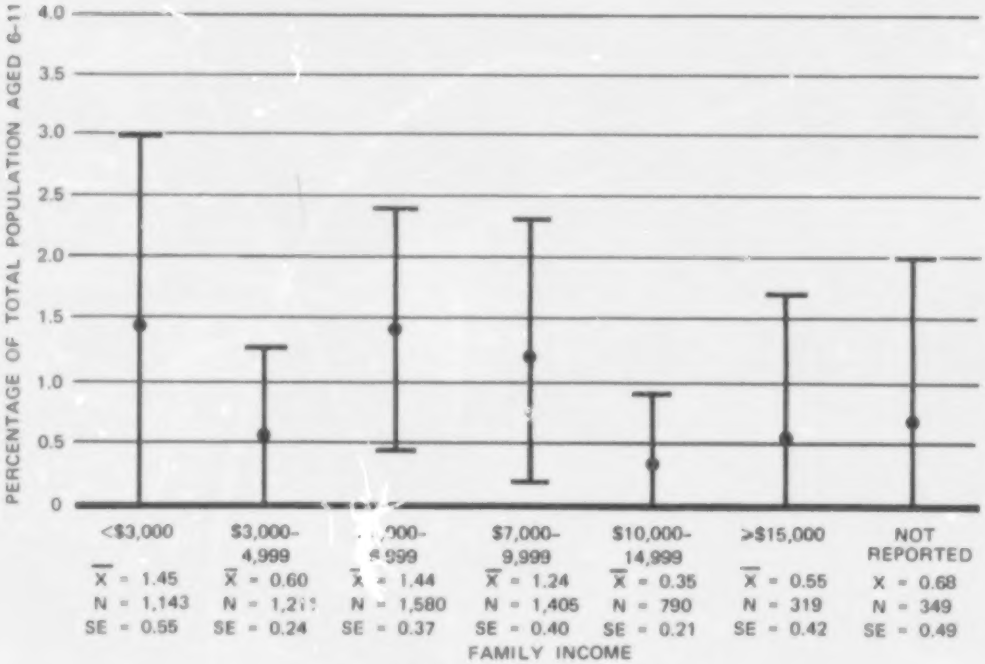


(c) TEACHER-IDENTIFIED VISUALLY HANDICAPPED STUDENTS AND ALL STUDENTS, AGED 12 TO 17

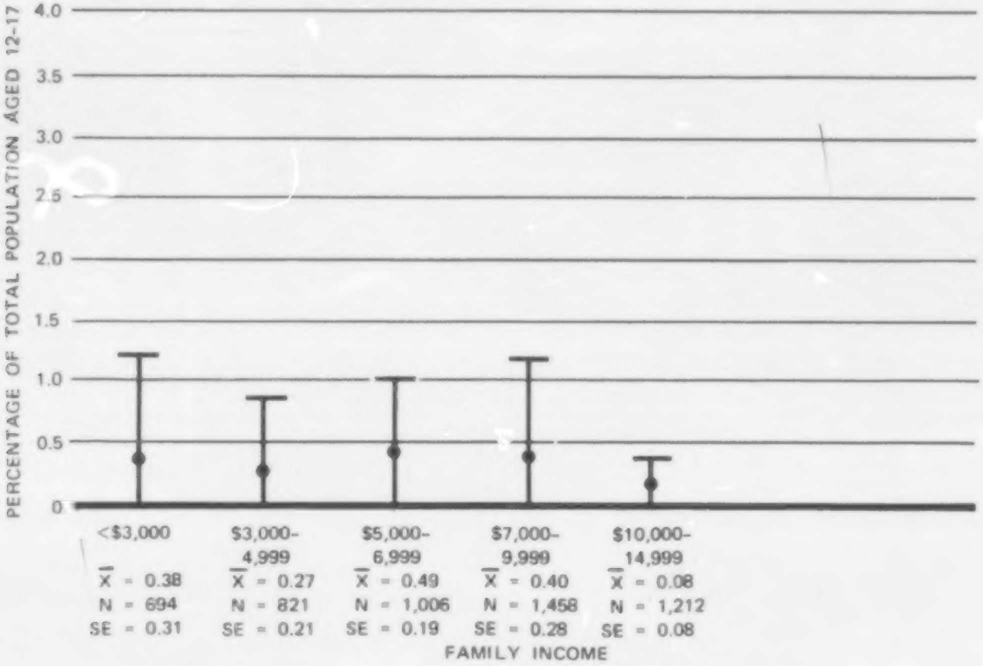


(d) TEACHER-IDENTIFIED SPEECH HANDICAPPED STUDENTS AND ALL STUDENTS, AGED 12 TO 17

FIGURE B.1 DISTRIBUTION, BY GEOGRAPHIC REGION, OF TEACHER-IDENTIFIED HANDICAPPED STUDENTS (PERCENTAGE OF POPULATION GROUP, 1964) (Concluded)

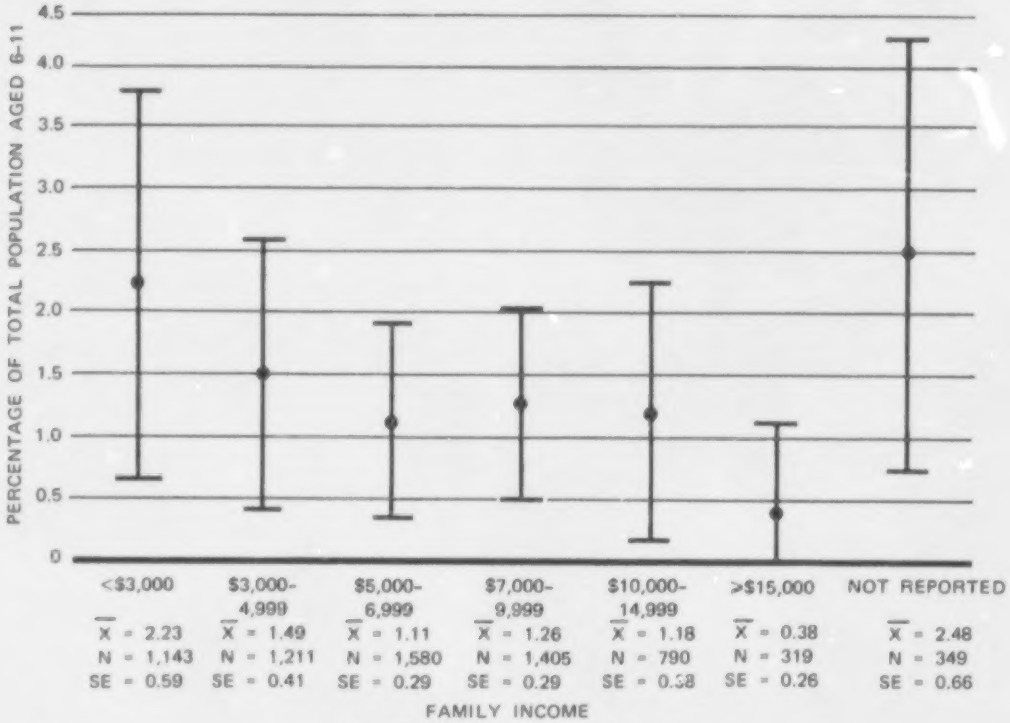


(a) STUDENTS AGED 6 TO 11

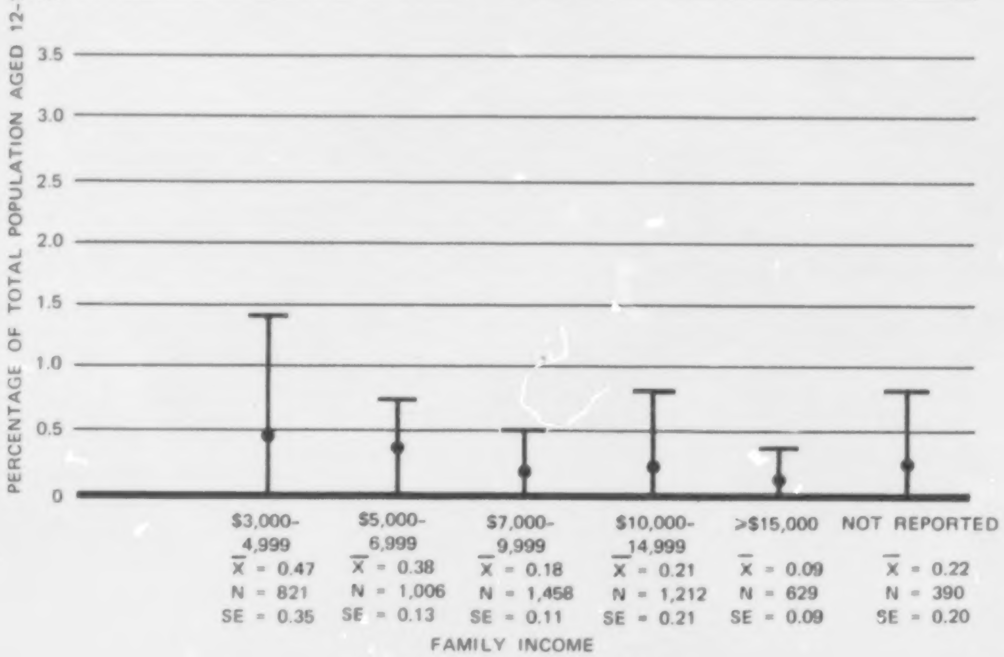


(b) STUDENTS AGED 12 TO 17

FIGURE B-2 TEACHER-IDENTIFIED HEARING HANDICAPPED, BY FAMILY INCOME: JOINT 95% CONFIDENCE INTERVALS

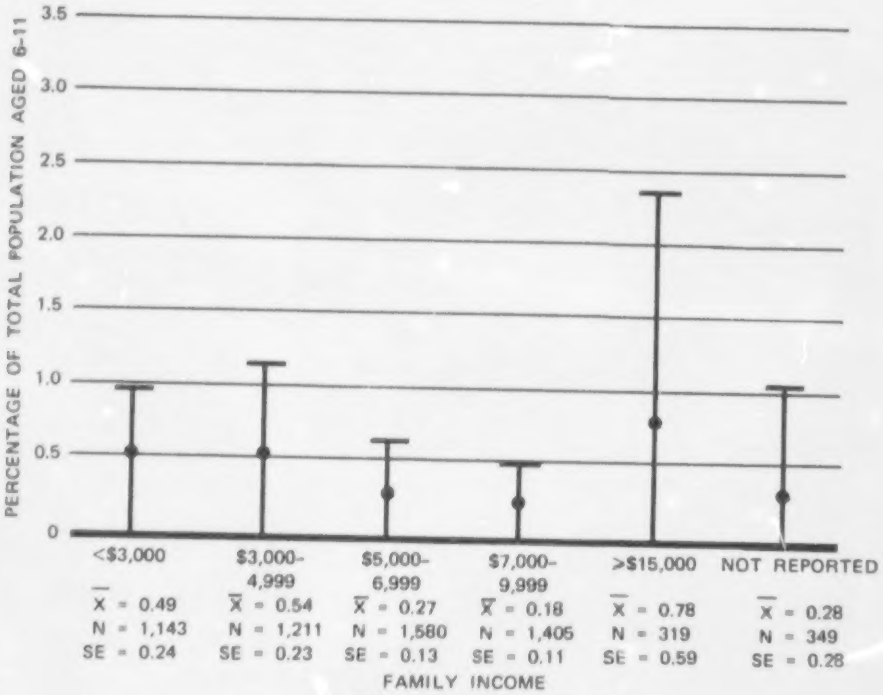


(a) STUDENTS AGED 6 TO 11

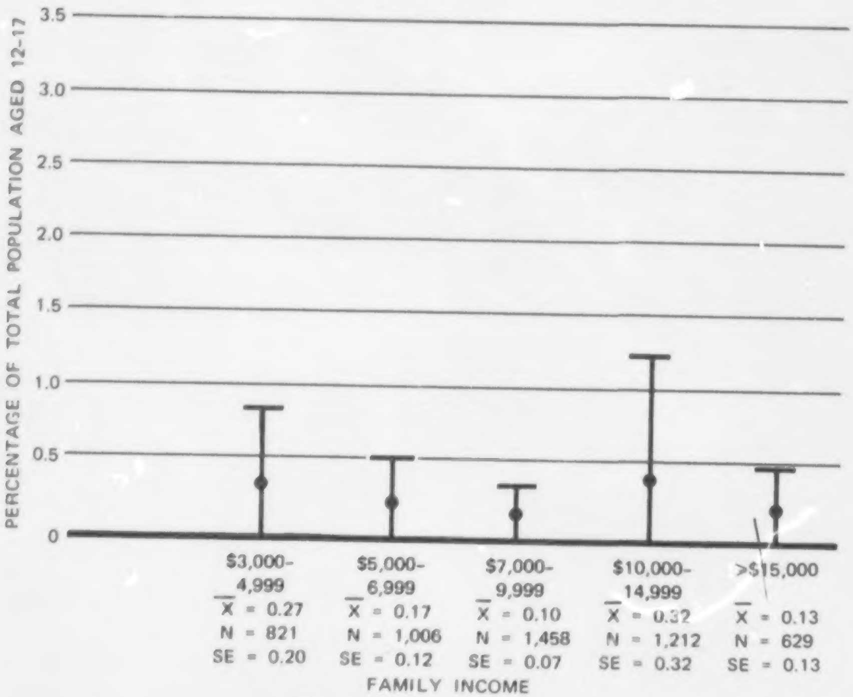


(b) STUDENTS AGED 12 TO 17

FIGURE B-3 TEACHER IDENTIFIED SIGHT HANDICAPPED, BY FAMILY INCOME: JOINT 95% CONFIDENCE INTERVALS

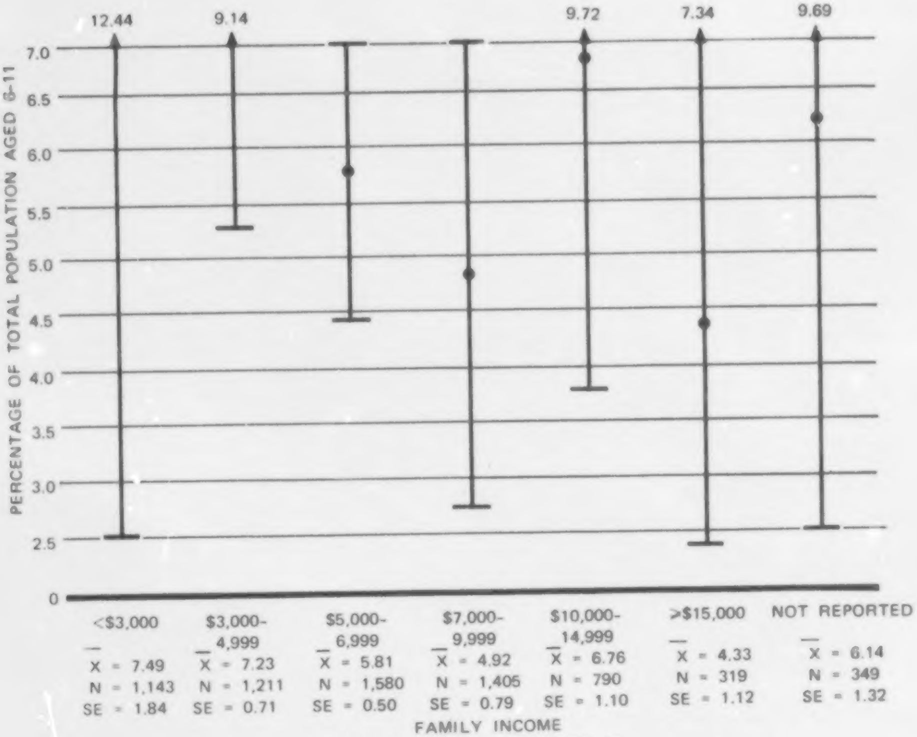


a) STUDENTS AGED 6 TO 11

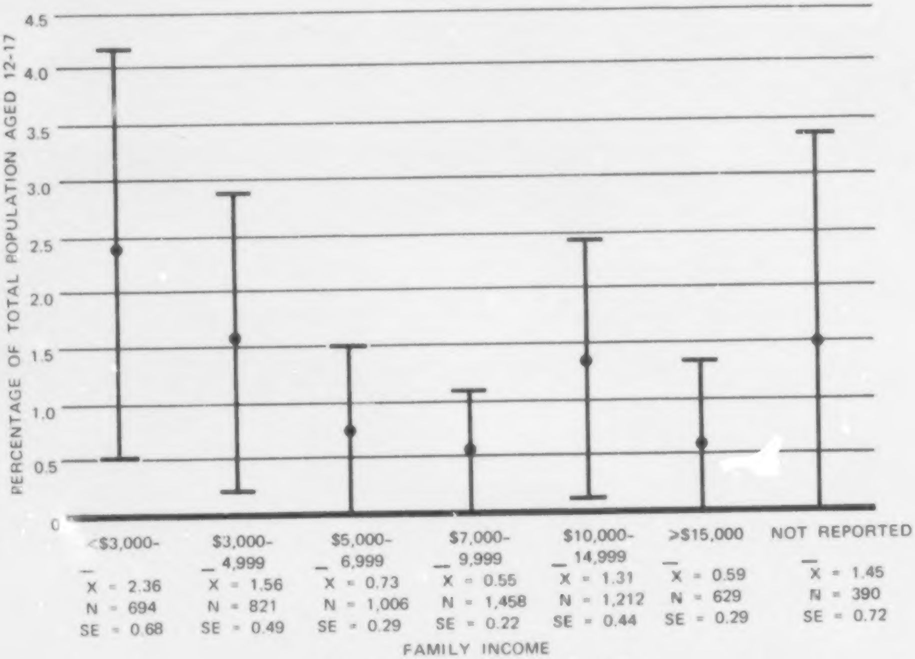


(b) STUDENTS AGED 12 TO 17

FIGURE B-4 TEACHER-IDENTIFIED ORTHOPEDICALLY HANDICAPPED, BY FAMILY INCOME: 95% JOINT CONFIDENCE INTERVALS

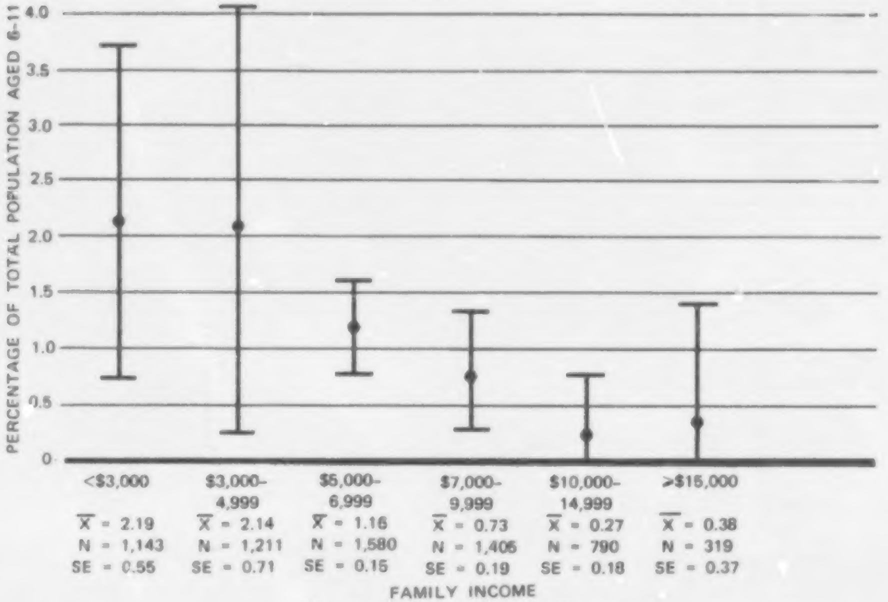


(a) **STUDENTS AGED 6 TO 11**

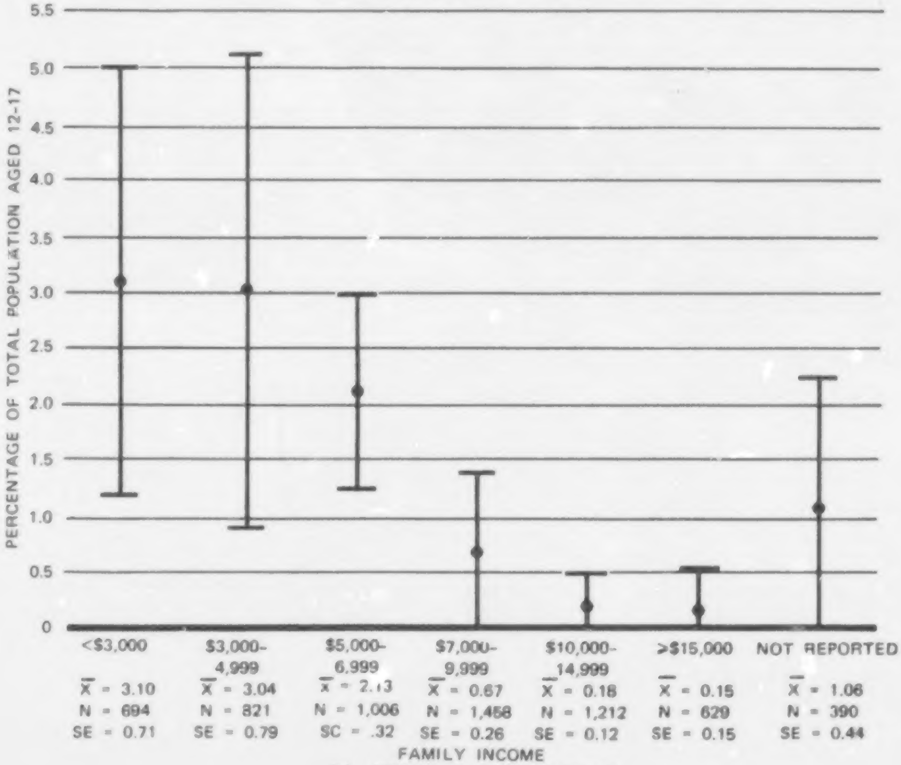


(b) **STUDENTS AGED 12 TO 17**

FIGURE B-5 TEACHER-IDENTIFIED SPEECH HANDICAPPED, BY FAMILY INCOME: 95% JOINT CONFIDENCE INTERVALS

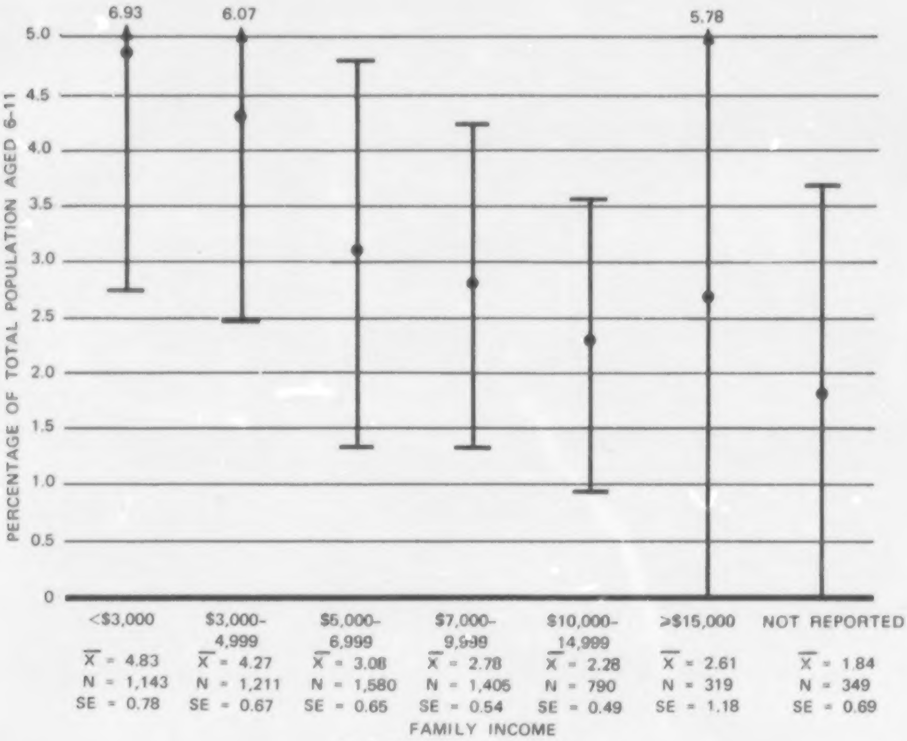


(a) STUDENTS AGED 6 TO 11

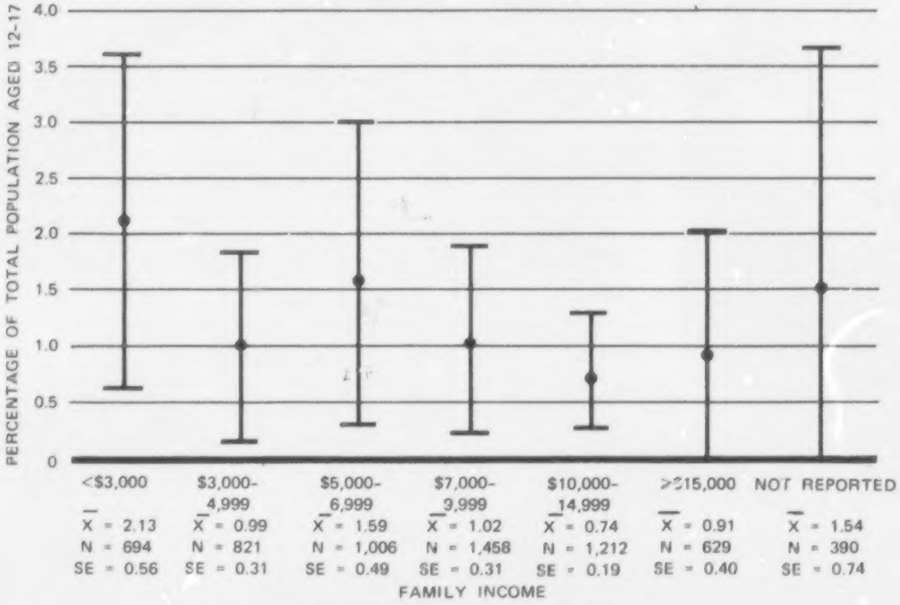


(b) STUDENTS AGED 12 TO 17

FIGURE B-6 TEACHER-IDENTIFIED MENTALLY RETARDED, BY FAMILY INCOME: 95% JOINT CONFIDENCE INTERVALS

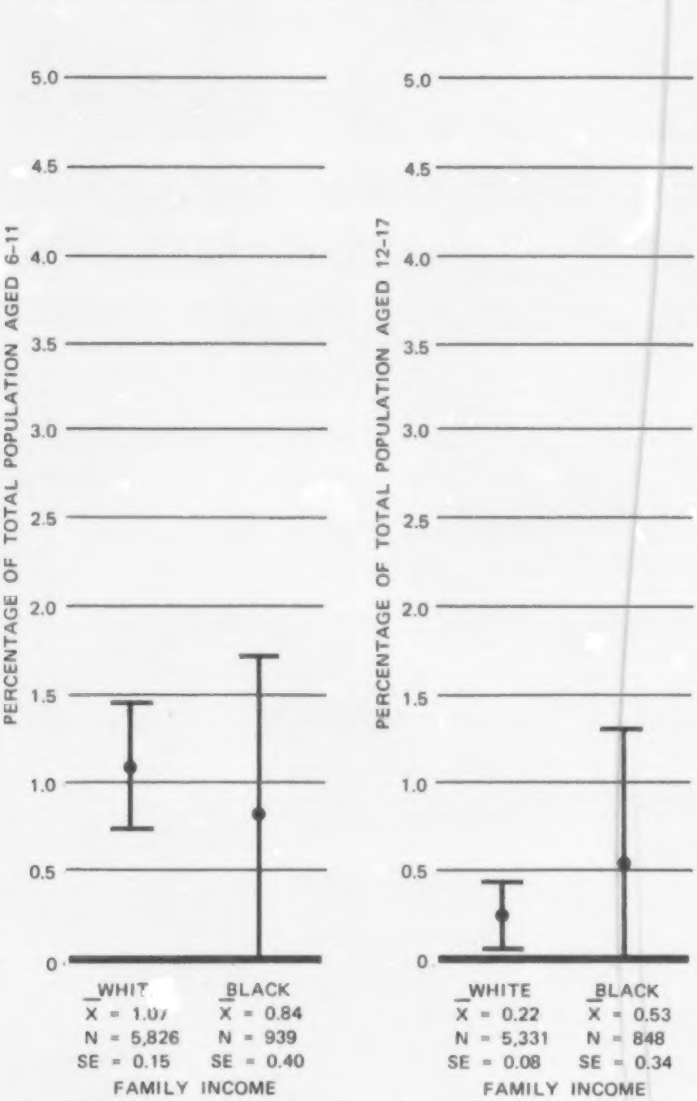


(a) STUDENTS AGED 6 TO 11



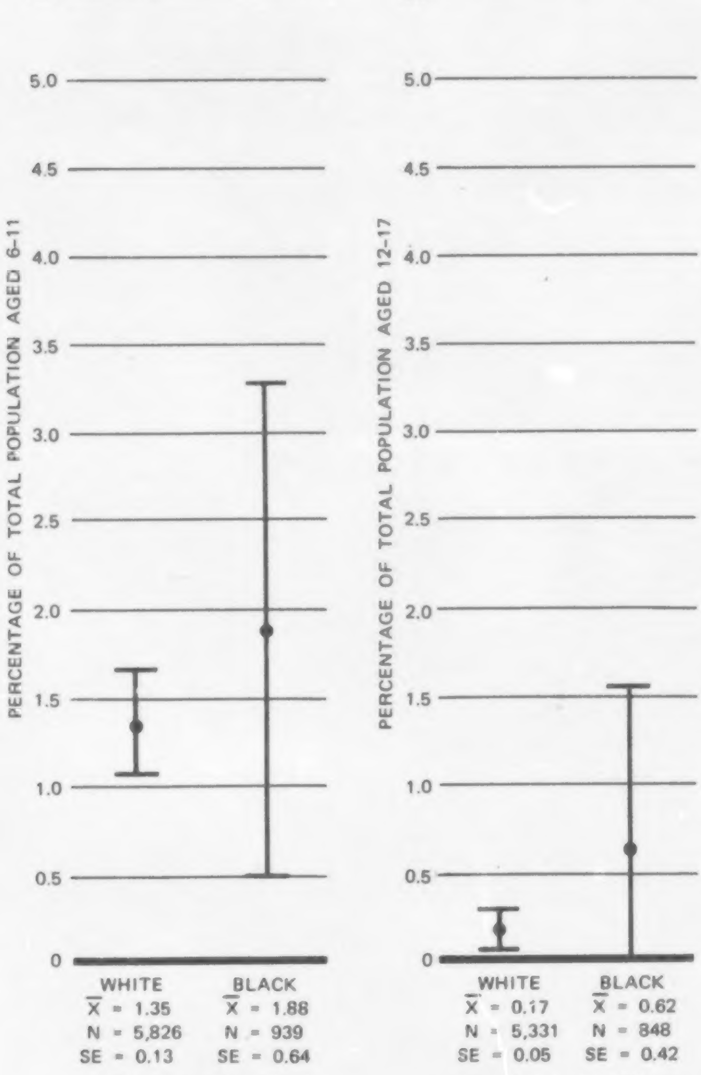
(b) STUDENTS AGED 12 TO 17

FIGURE B-7 TEACHER-IDENTIFIED EMOTIONALLY DISTURBED, BY FAMILY INCOME: JOINT 95% CONFIDENCE INTERVALS



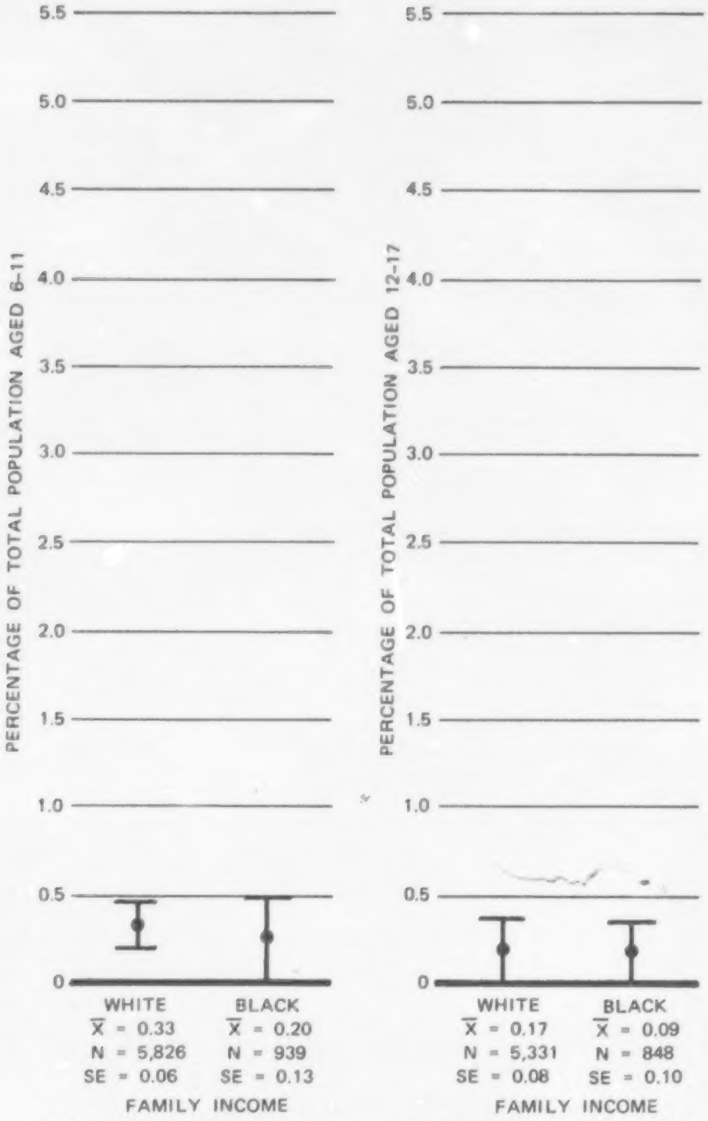
(a) STUDENTS AGED 6 TO 11 (b) STUDENTS AGED 12 TO 17

FIGURE B-8 TEACHER-IDENTIFIED HEARING HANDICAPPED, BY RACE: JOINT 95% CONFIDENCE INTERVALS



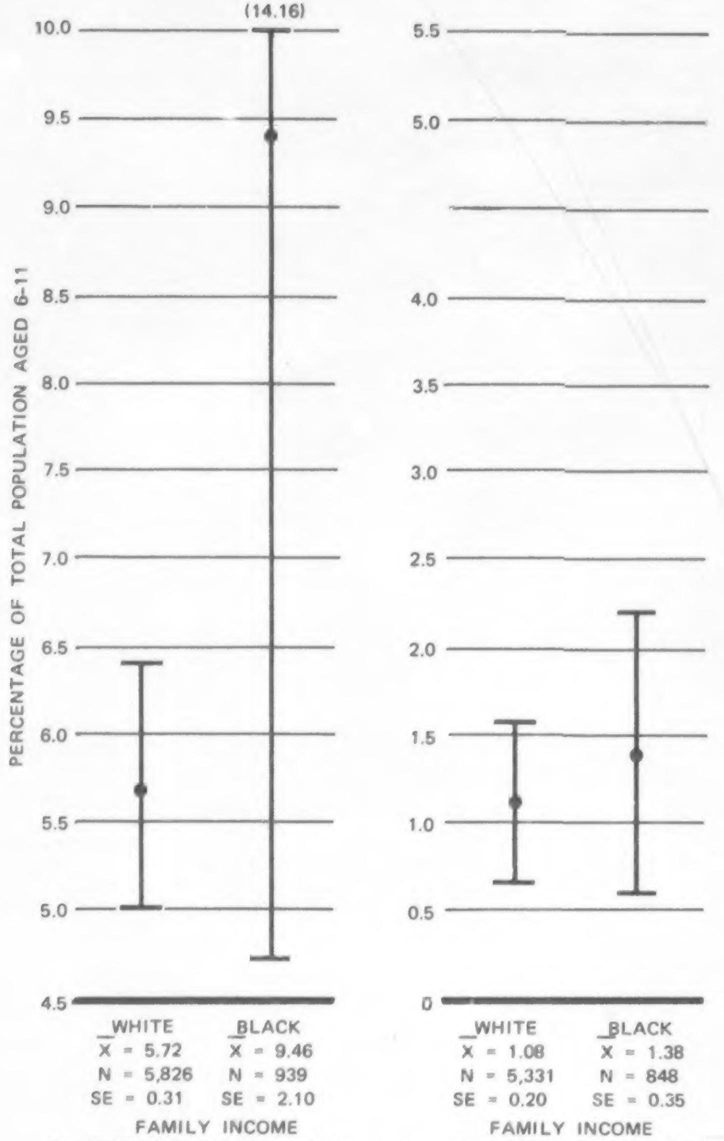
(a) STUDENTS AGED 6 TO 11 **(b) STUDENTS AGED 12 TO 17**

FIGURE B-9 TEACHER-IDENTIFIED SIGHT HANDICAPPED, BY RACE: JOINT 95% CONFIDENCE INTERVALS



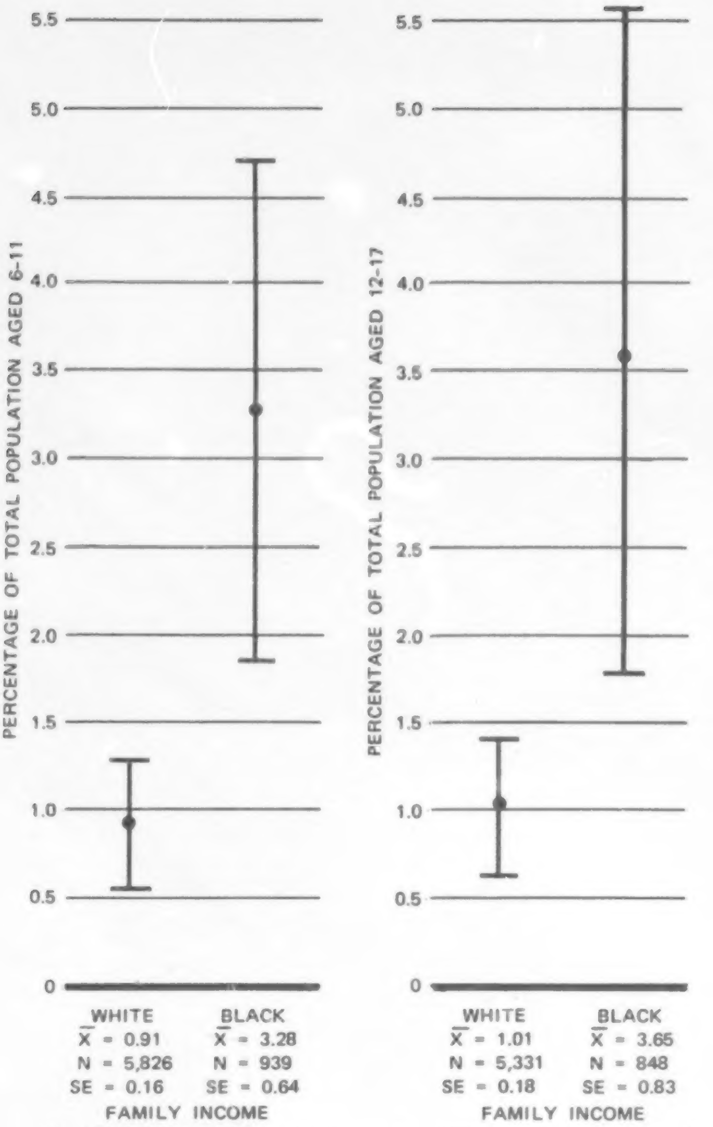
(a) STUDENTS AGED 6 TO 11 **(b) STUDENTS AGED 12 TO 17**

FIGURE B-10 TEACHER-IDENTIFIED ORTHOPEDICALLY HANDICAPPED, BY RACE: JOINT 95% CONFIDENCE INTERVALS



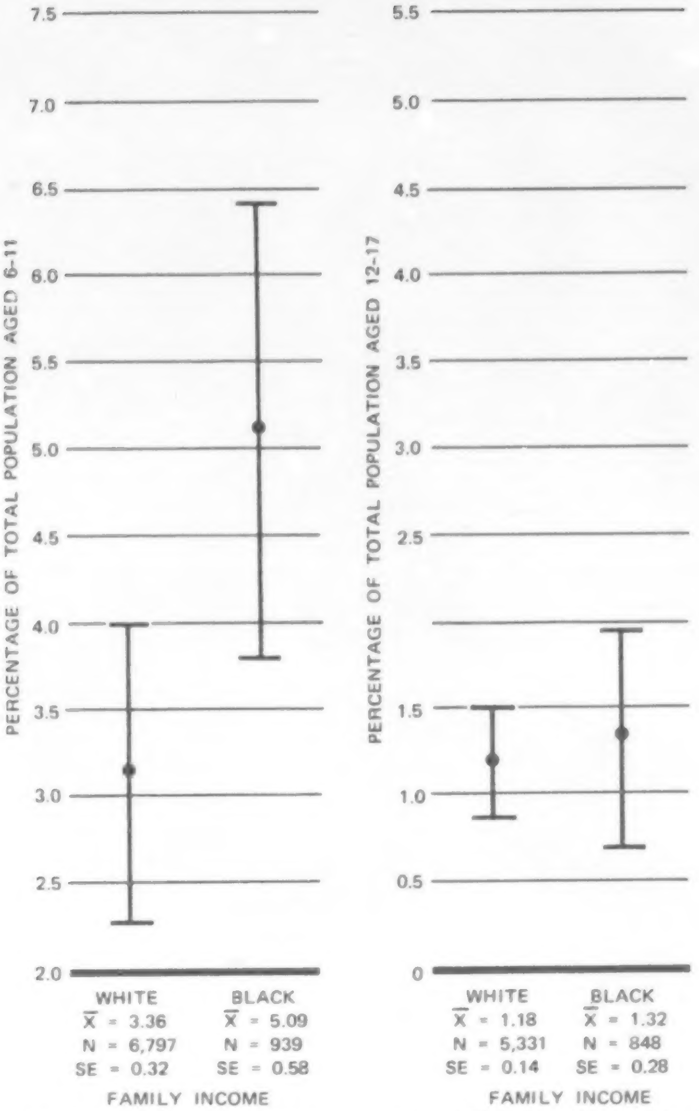
(a) STUDENTS AGED 6 TO 11 **(b) STUDENTS AGED 12 TO 17**

FIGURE B-11 TEACHER-IDENTIFIED SPEECH HANDICAPPED, BY RACE: JOINT 95% CONFIDENCE INTERVALS



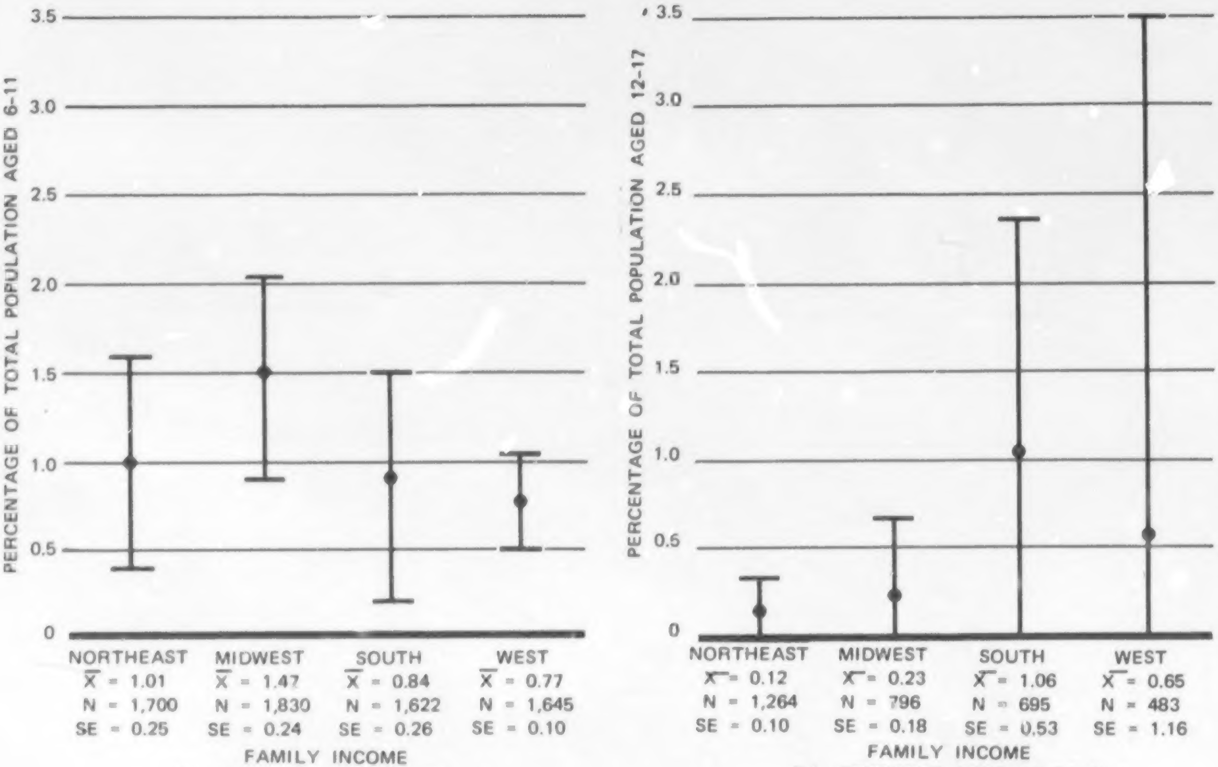
(a) STUDENTS AGED 6 TO 11 **(b) STUDENTS AGED 12 TO 17**

FIGURE B-12 TEACHER-IDENTIFIED MENTALLY RETARDED, BY RACE: JOINT 95% CONFIDENCE INTERVALS



(a) STUDENTS AGED 6 TO 11 **(b) STUDENTS AGED 12 TO 17**

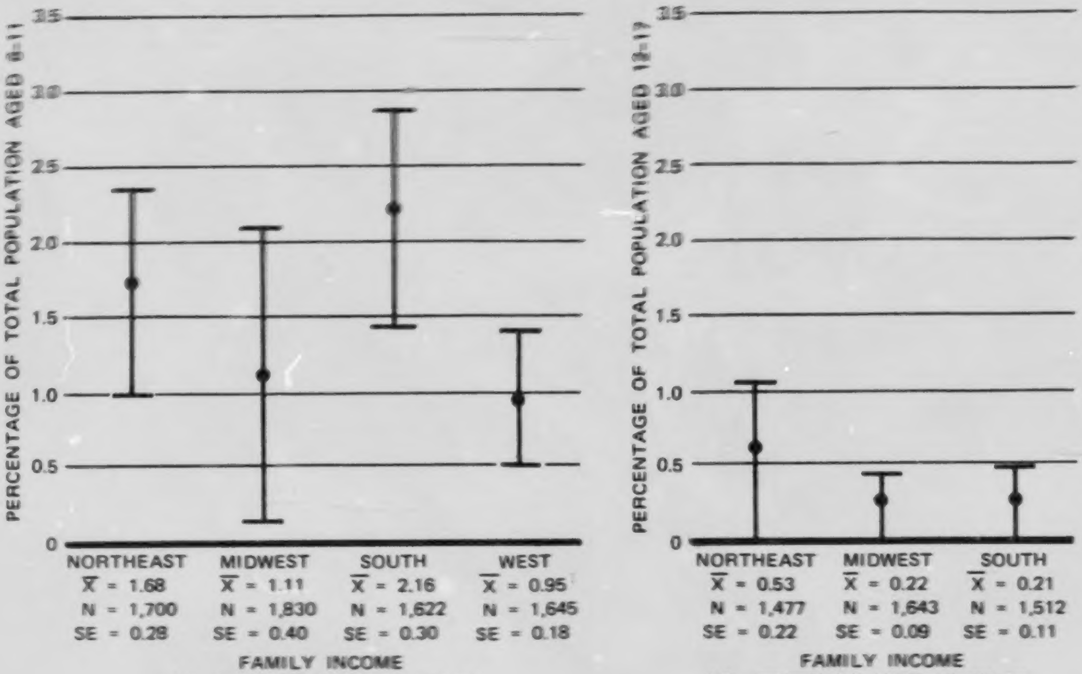
FIGURE B-13 TEACHER-IDENTIFIED EMOTIONALLY DISTURBED, BY RACE: JOINT 95% CONFIDENCE INTERVALS



(a) STUDENTS AGED 6 TO 11

(b) STUDENTS AGED 12 TO 17

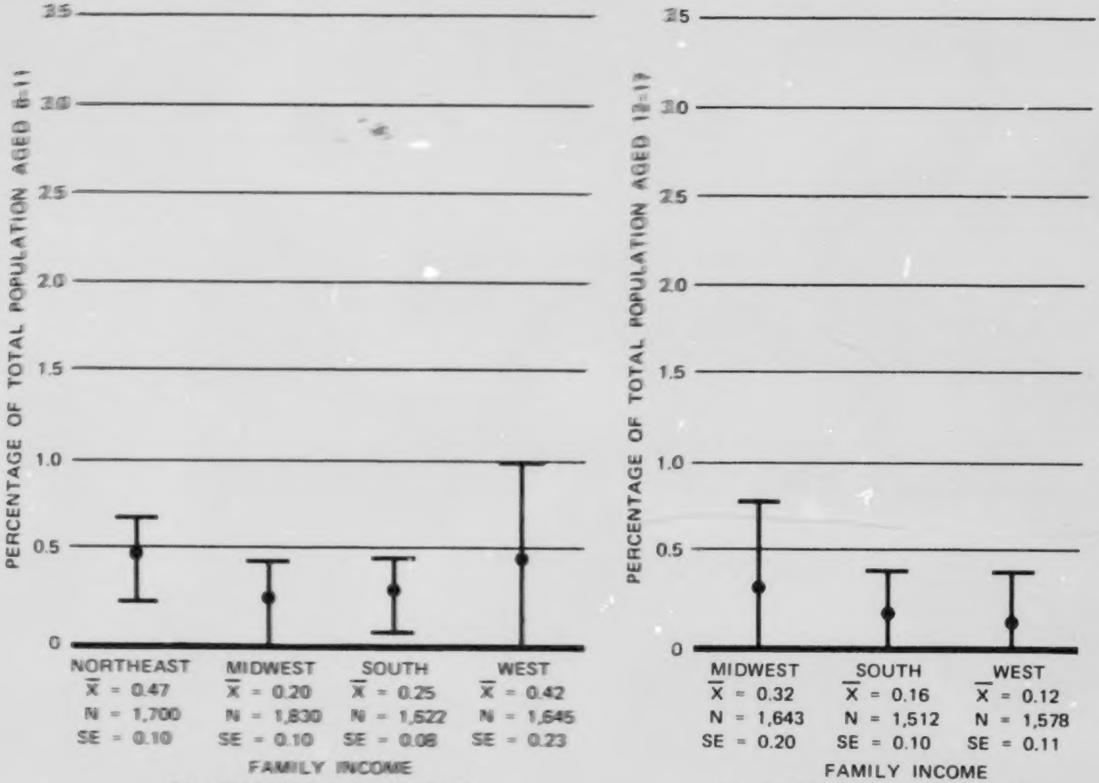
FIGURE B-14 TEACHER-IDENTIFIED HEARING HANDICAPPED, BY REGION: JOINT 95% CONFIDENCE INTERVALS



(a) STUDENTS AGED 6 TO 11

(b) STUDENTS AGED 12 TO 17

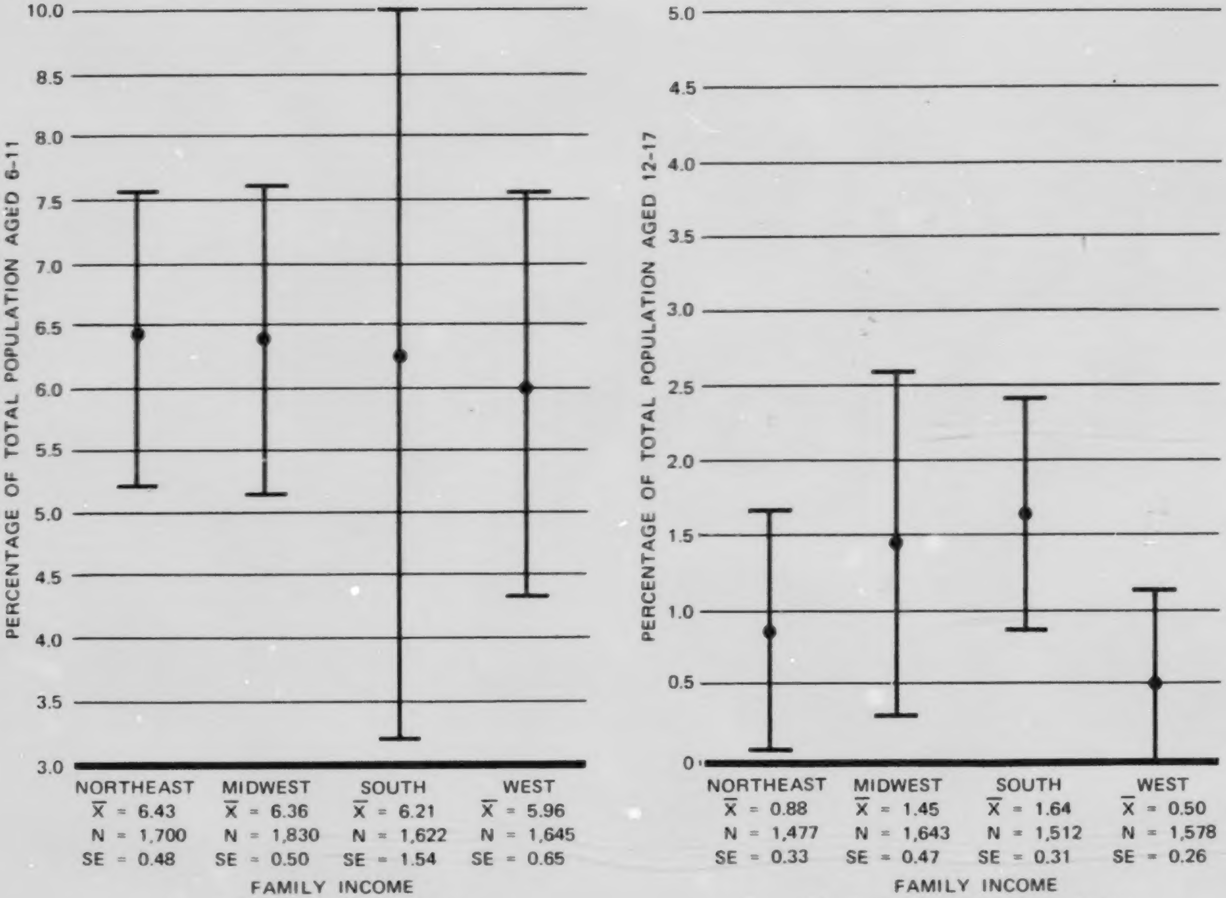
FIGURE B-15 TEACHER-IDENTIFIED SIGHT HANDICAPPED, BY REGION: JOINT 95% CONFIDENCE INTERVALS



(a) STUDENTS AGED 6 TO 11

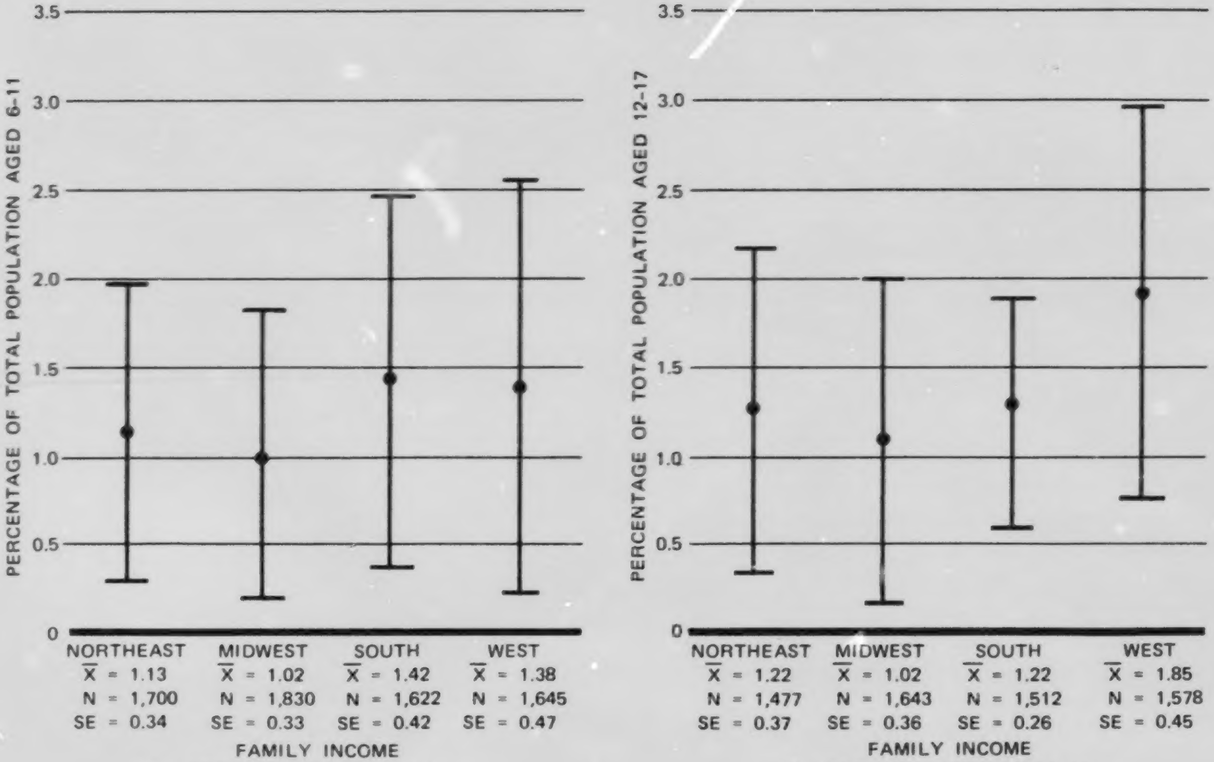
(b) STUDENTS AGED 12 TO 17

FIGURE B-16 TEACHER-IDENTIFIED ORTHOPEDICALLY HANDICAPPED, BY REGION: JOINT 95% CONFIDENCE INTERVALS



(a) STUDENTS AGED 6 TO 11 **(b) STUDENTS AGED 12 TO 17**

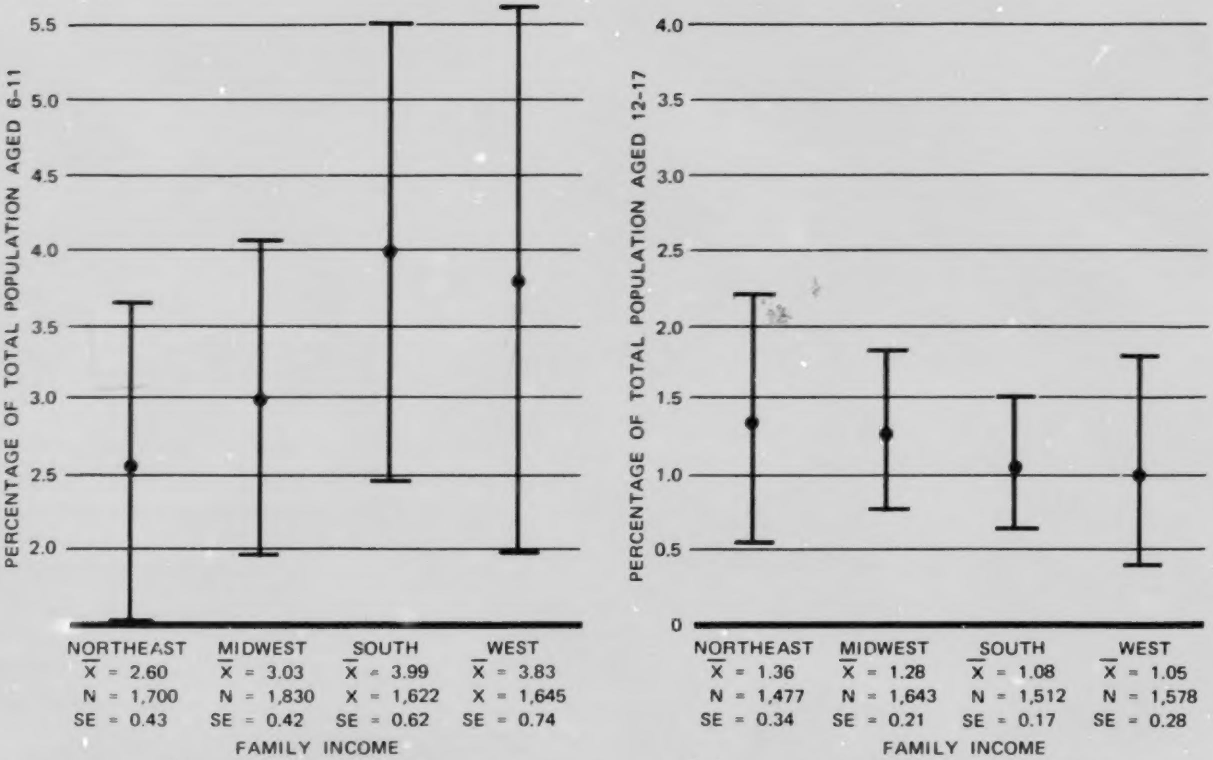
FIGURE B-17 TEACHER-IDENTIFIED SPEECH HANDICAPPED, BY REGION: JOINT 95% CONFIDENCE INTERVALS



(a) STUDENTS AGED 6 TO 11

(b) STUDENTS AGED 12 TO 17

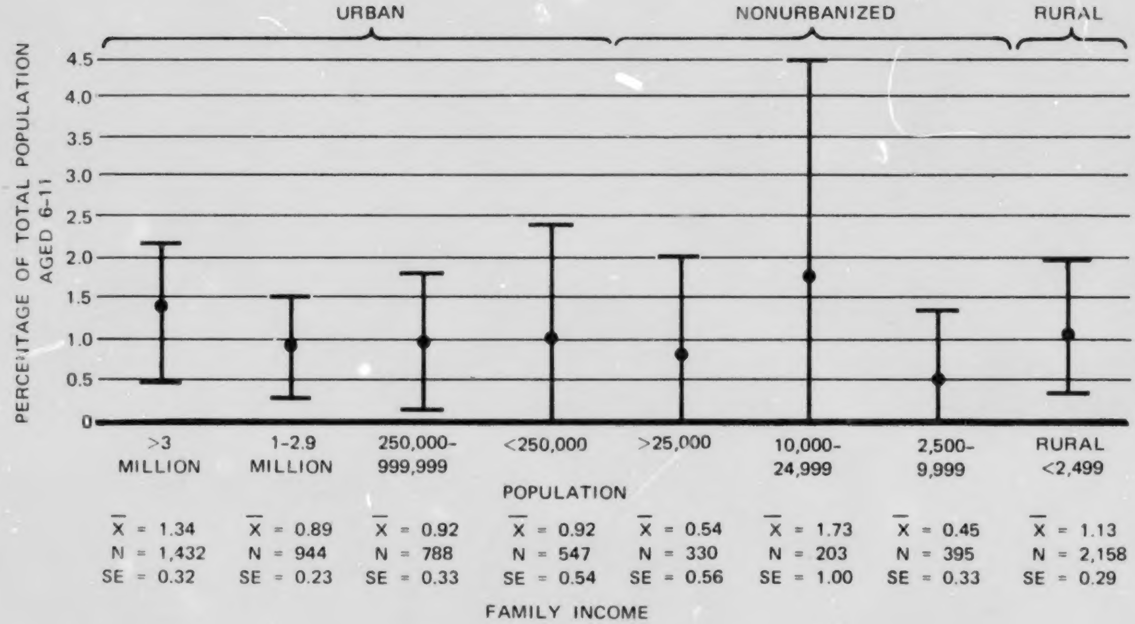
FIGURE B-18 TEACHER-IDENTIFIED MENTALLY RETARDED BY REGION: JOINT 95% CONFIDENCE INTERVALS



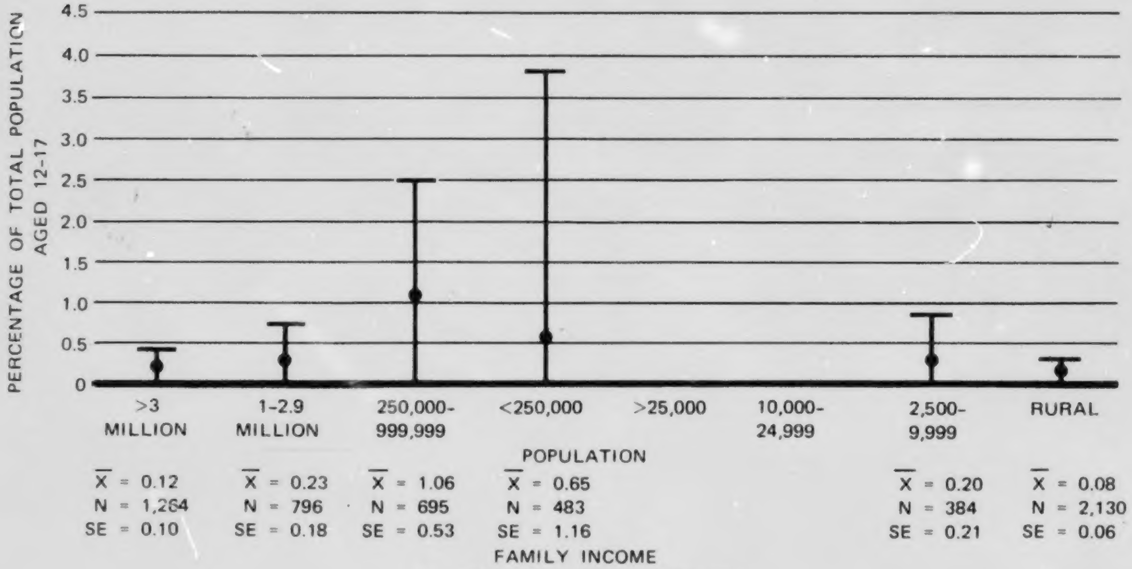
(a) STUDENTS AGED 6 TO 11

(b) STUDENTS AGED 12 TO 17

FIGURE B-19 TEACHER-IDENTIFIED EMOTIONALLY DISTURBED, BY REGION: JOINT 95% CONFIDENCE INTERVALS

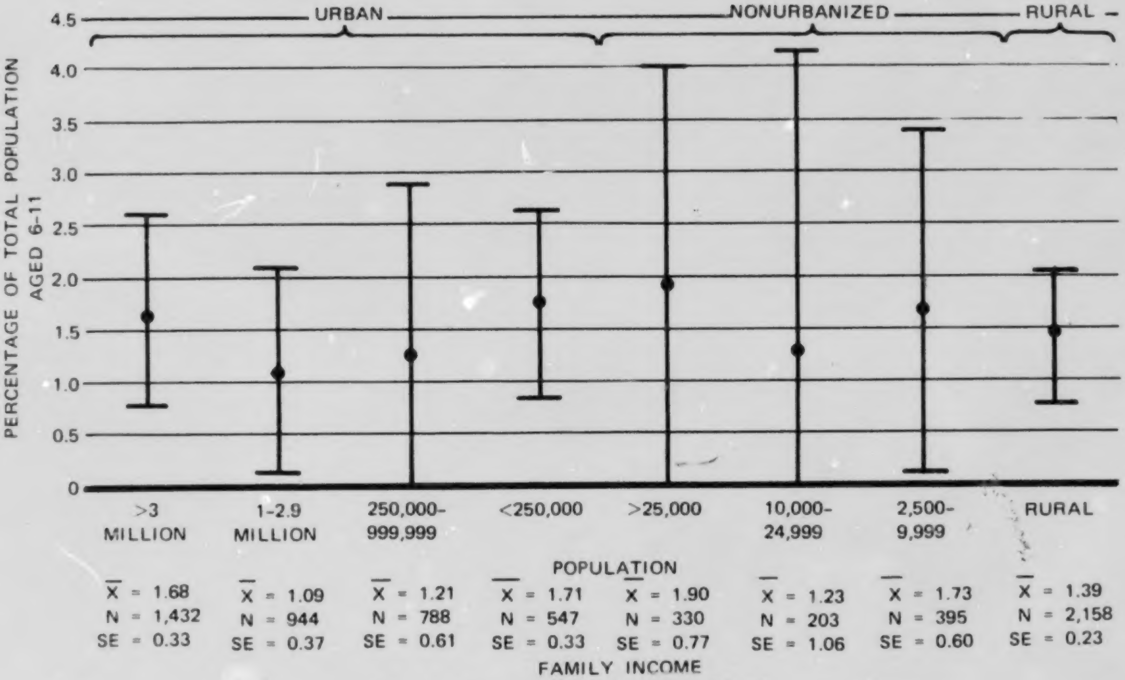


(a) STUDENTS AGED 6 TO 11

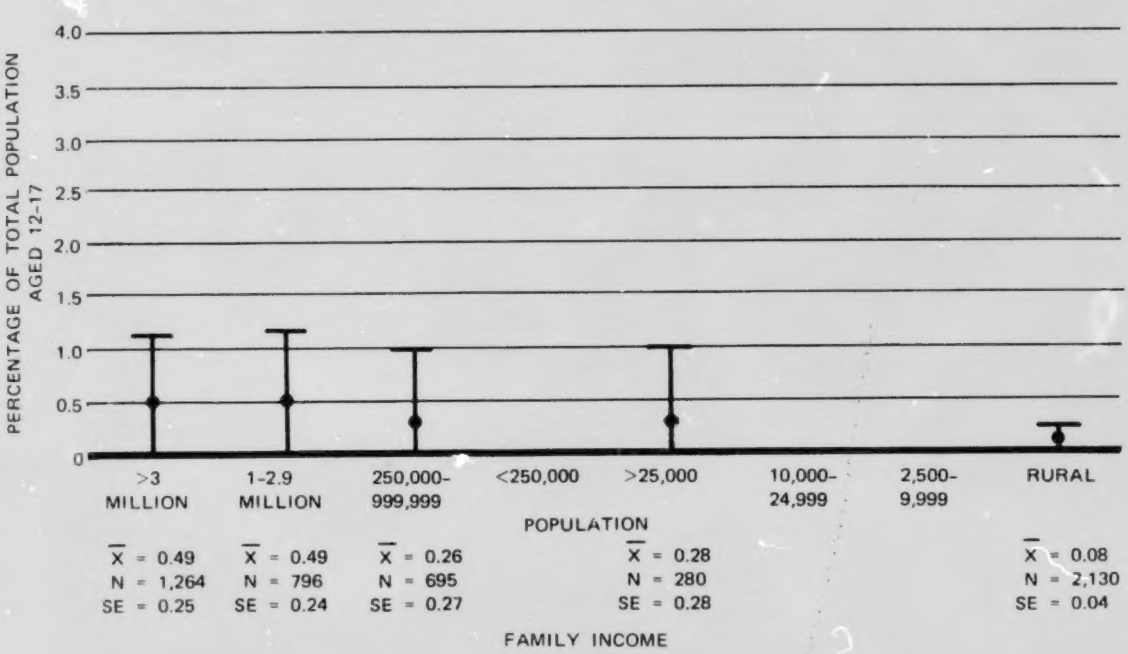


(b) STUDENTS AGED 12 TO 17

FIGURE B-20 TEACHER-IDENTIFIED HEARING HANDICAPPED, BY POPULATION DENSITY OF PLACE OF RESIDENCE: JOINT 95% CONFIDENCE INTERVALS

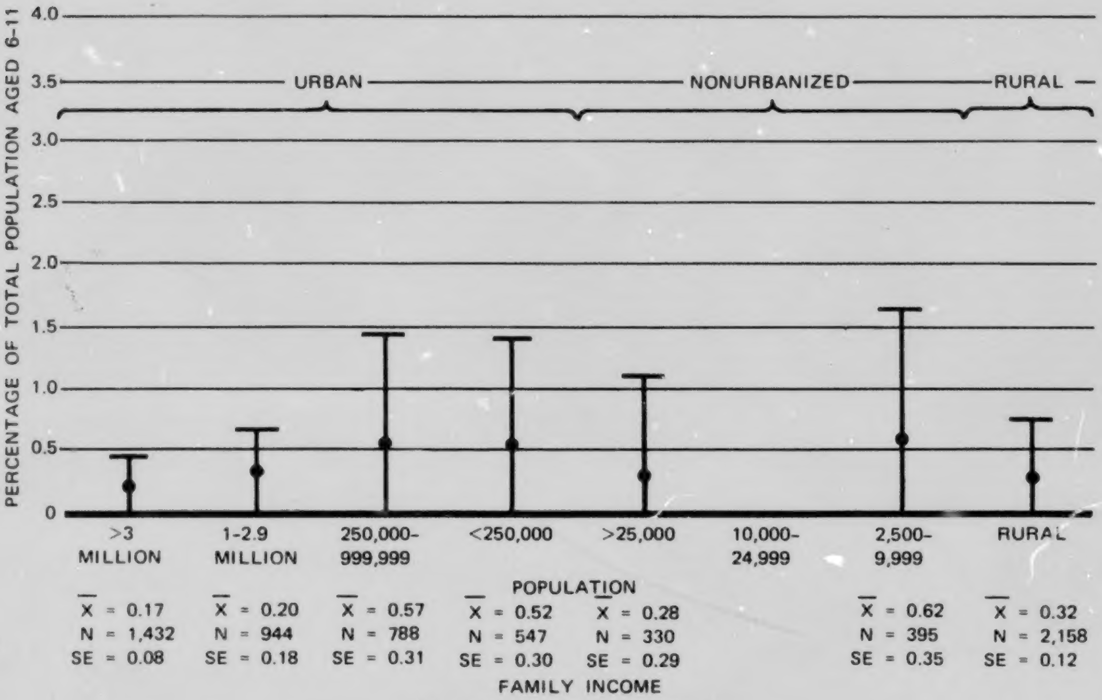


(a) STUDENTS AGED 6 TO 11

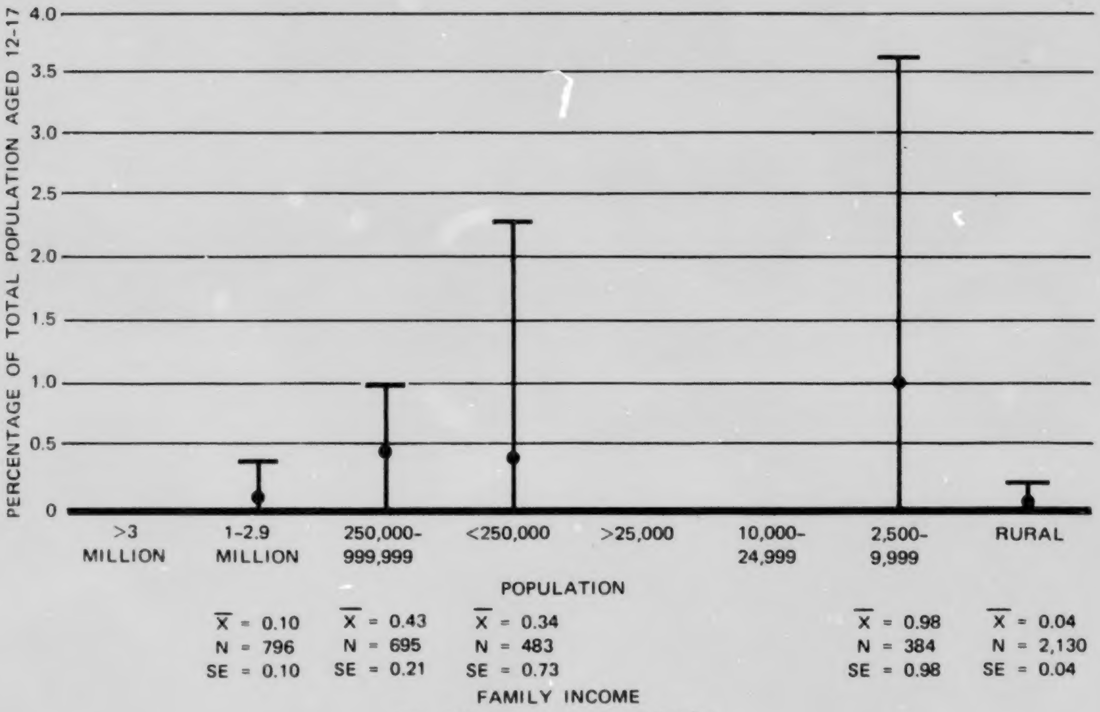


(b) STUDENTS AGED 12 TO 17

FIGURE B-21 TEACHER-IDENTIFIED SIGHT HANDICAPPED, BY POPULATION DENSITY OF PLACE OF RESIDENCE: JOINT 95% CONFIDENCE INTERVALS

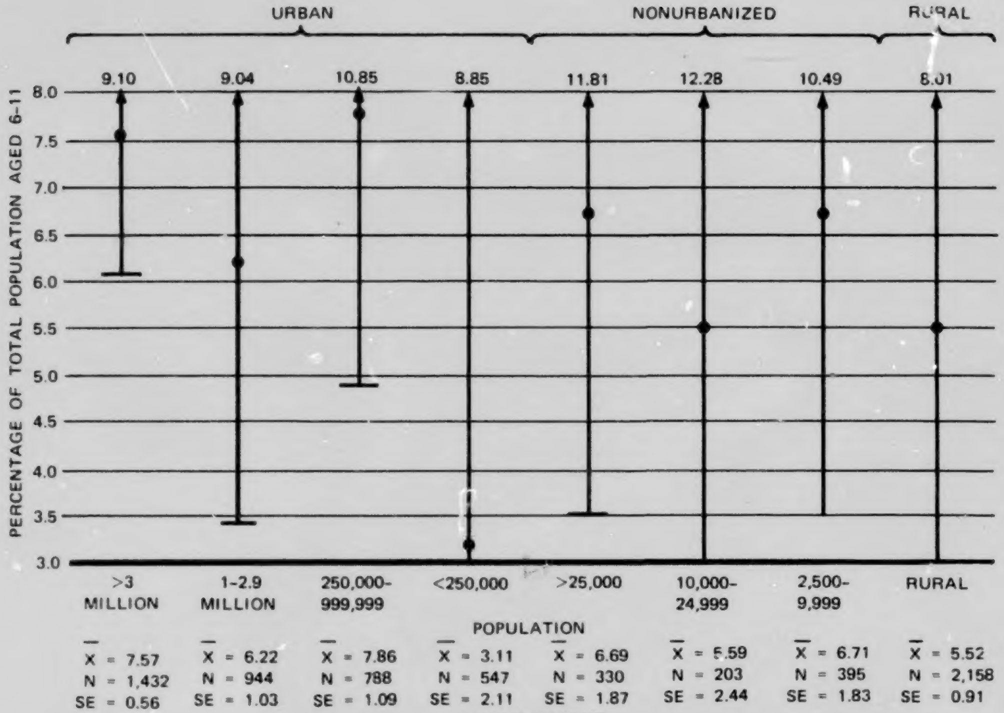


(a) STUDENTS AGED 6 TO 11



(b) STUDENTS AGED 12 TO 17

FIGURE B-22 TEACHER-IDENTIFIED ORTHOPEDICALLY HANDICAPPED, BY POPULATION DENSITY OF PLACE OF RESIDENCE: JOINT 95% CONFIDENCE INTERVALS



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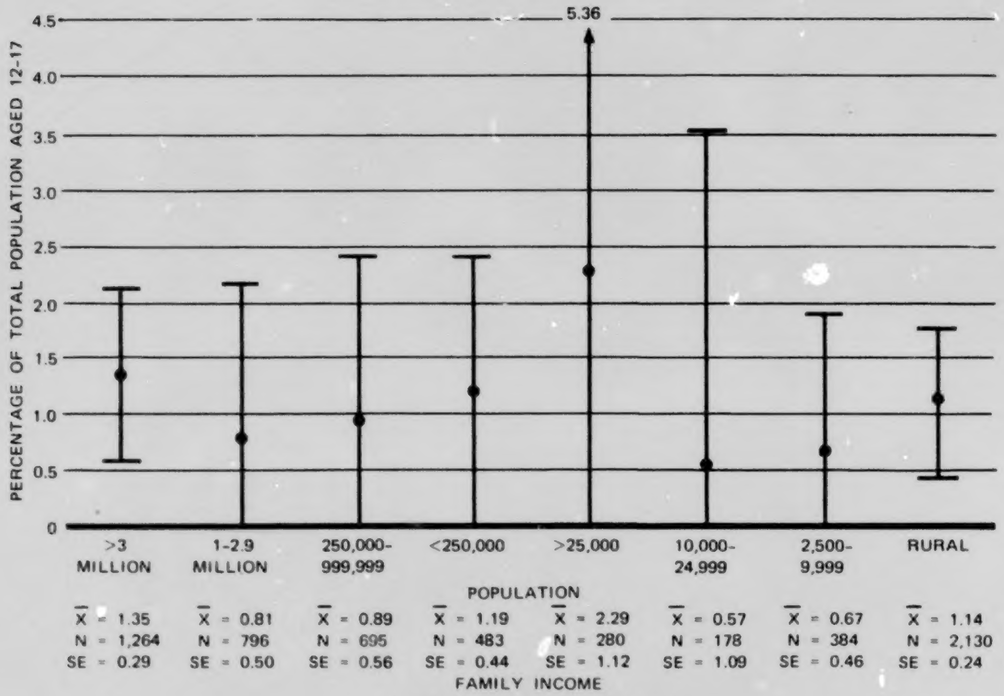
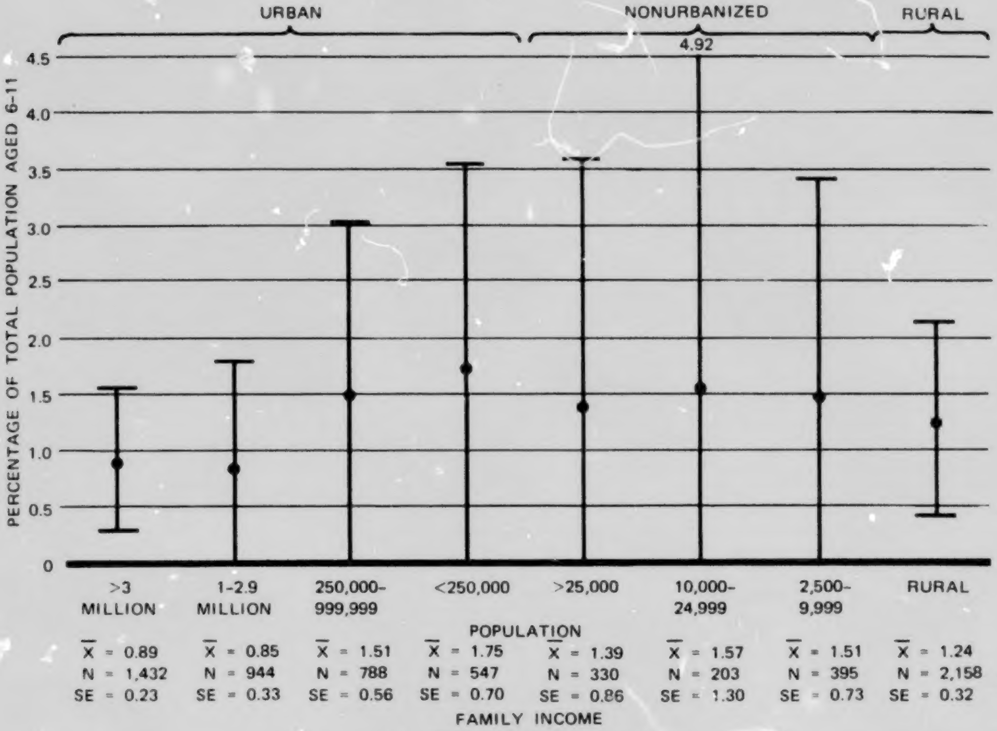


(b) STUDENTS AGED 12 TO 17

FIGURE B-23 TEACHER-IDENTIFIED SPEECH HANDICAPPED, BY POPULATION DENSITY OF PLACE OF RESIDENCE: JOINT 95% CONFIDENCE INTERVALS



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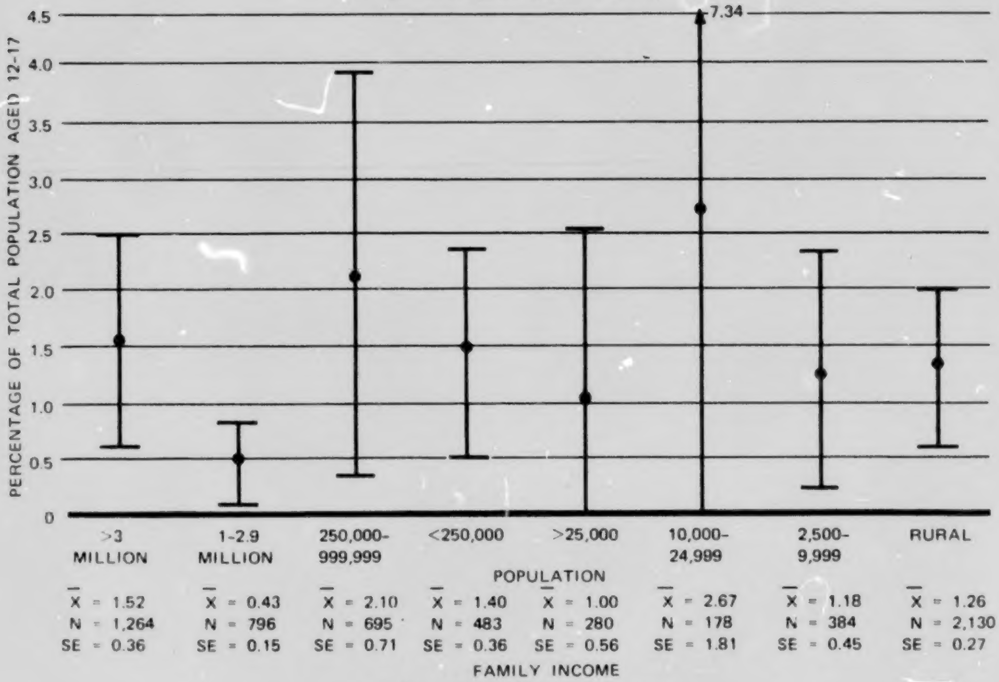
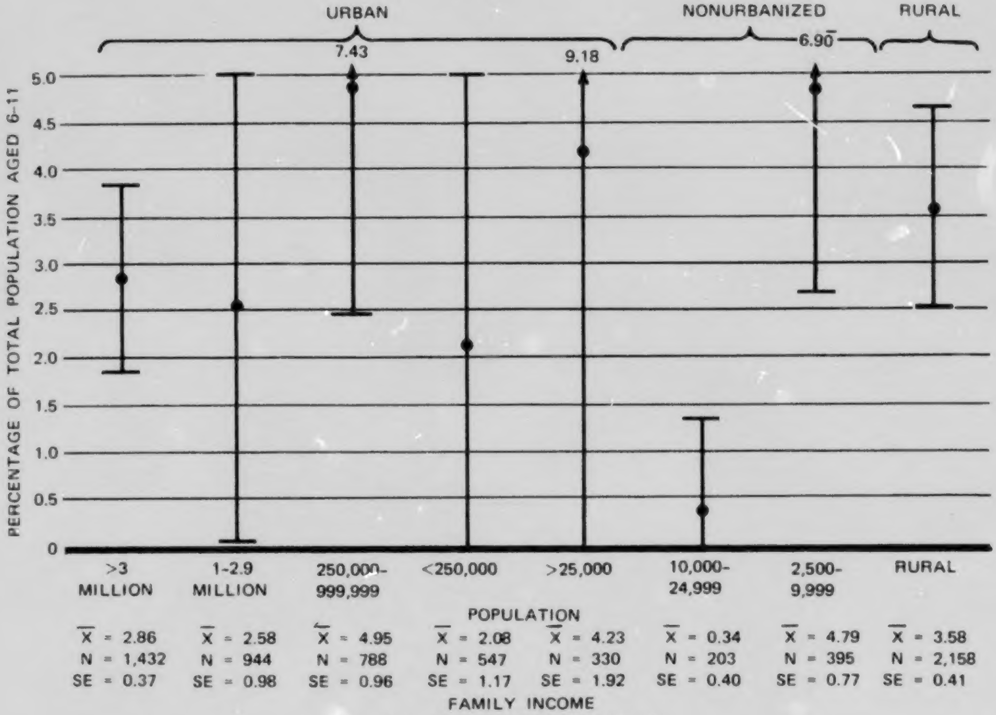
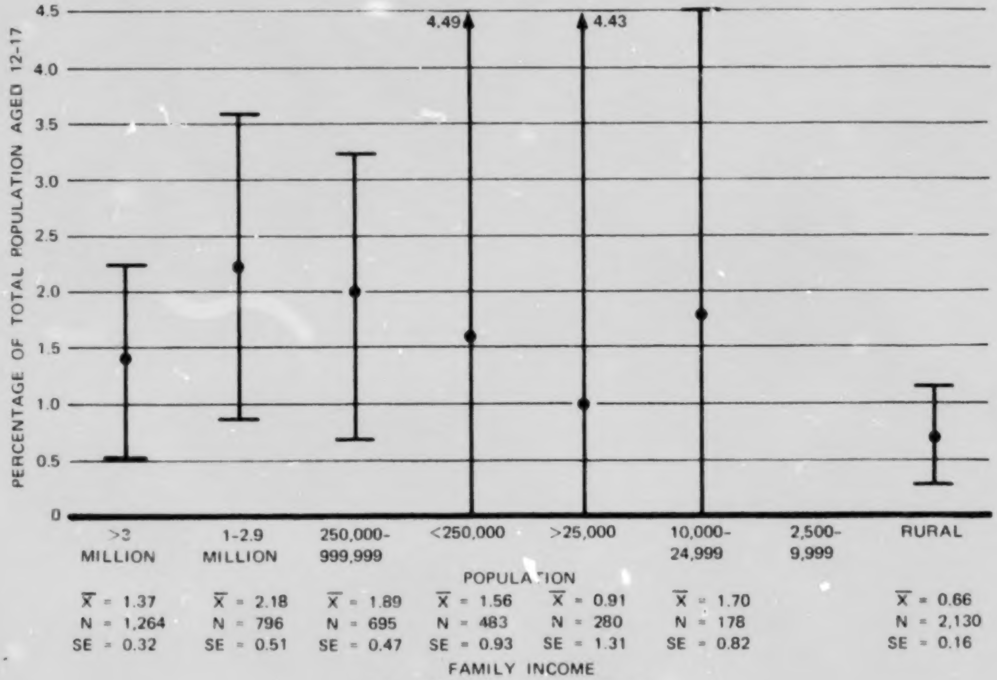


(b) STUDENTS AGED 12 TO 17

FIGURE B-24 TEACHER-IDENTIFIED MENTALLY RETARDED, BY POPULATION DENSITY OF PLACE OF RESIDENCE: JOINT 95% CONFIDENCE INTERVALS



(a) STUDENTS AGED 6 TO 11



(b) STUDENTS AGED 12 TO 17

FIGURE B-25 TEACHER-IDENTIFIED EMOTIONALLY DISTURBED, BY POPULATION DENSITY OF PLACE OF RESIDENCE: JOINT 95% CONFIDENCE INTERVALS

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STUDIES OF HANDICAPPED STUDENTS

Volume II Teacher Identification of Handicapped Pupils (Ages 6-11) Compared With Identification Using Other Indicators

Research Report EPRC 4537-11

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EXECUTIVE SUMMARY

This is the second volume of a two-volume study of handicapped students, exploring the characteristics of students recommended for special education resources and those actually receiving special education resources for the handicapped. The Educational Policy Research Center (EPRC) study of handicapped children explores the findings of a national survey of children conducted by the National Center for Health Statistics, findings that have only recently become publicly available.

Volume I reported on patterns of socioeconomic status and demographic variations of 14,185 students, ages 6-17, recommended by teachers as requiring special education resources for hearing, vision, mental retardation, emotional disturbance, orthopedic, and speech handicaps. The major findings of Volume I were that for all groups of children at the elementary school level who were recommended for special resources, those from low-income families were far more likely to be recommended for special resources than children from moderate- or high-income families. Additionally, it was found that Black elementary school children were recommended at a rate that was more than twice that of their White peers.

Volume II extends the work of Volume I by using the NCHS data to explore variations in rates and the characteristics of over 7,000 children (ages 6-11) selected as possibly needing special education resources on the basis of various indicators of need. We have compared the population recommended by teachers as needing special educational resources with indicators developed from medical examination findings, school behaviors, test scores, developmental histories, and parent responses about home behaviors. We have also compared differences in indicator rates for students receiving special educational resources, those for whom resources were available but not used, and those for whom resources were recommended but not available. Particular questions of interest in this second volume are:

- What is the variation in rates of possible handicapping conditions using different indicators of need?
- How much agreement is there between populations defined by the different sets of indicators?
- How do patterns of identification, based on these indicators, compare across socioeconomic and demographic characteristics, school and home behaviors, developmental histories, and school achievement?

Our approach in selecting sets of indicators of actual or potential handicaps was to make a careful examination of the NCHS data file and, with the aid of consultants, to establish sets of variables that would be useful in identifying possible needs for special educational services. It must be stressed that the variables selected as indicators of possible need for purposes of this study are not necessarily criteria for determining whether or not a handicap exists. Thus, this study is not an attempt to estimate the incidence of particular handicaps among children, or to validate the existence of need for special educational resources. Rather, the study explores the relationship among numerous factors commonly thought to be associated with handicapping conditions for children who have and have not been recommended for special resources for the handicapped and for children who are actually receiving special educational resources for the handicapped.

Detailed findings for each group of handicapped children are discussed in Section VIII of this report and we mention here only a few of the more general findings of the study. One of the most consistent findings in exploring these relationships among health, behavior, and performance variables of children in this sample is the small overlap and lack of agreement in children identified by sets of selected indicators. That is, most children identified by the teachers recommendation of need for special education resources are not the same group of children identified by parent indicators, medical examination findings, or performance test scores. In most cases children identified by any indicator represented a distinct population either with respect to achievement, home and school behaviors or socio-economic characteristics. For example, children identified for speech therapy classes either by the teachers recommendation or by the parent indicator of need had school behavior profiles very different from children not identified--they appeared to be more socially disruptive in school than were other children. However, there was variation in the degree to which the populations identified by different indicators were distinct. For example, children identified from the parent responses as possibly mentally retarded were more like children not identified as candidates for these services than were children identified by both the teachers recommendation and parent indicators or by the teacher and by the estimated full-scale IQ (EFSIQ) score.

For children identified by the teacher as requiring special classes for the mentally retarded, as well as for those actually receiving services for the mentally retarded, deviant social behavior at school seemed to be a more important characteristic of identified children than did their IQ score. Many children with EFSIQ scores above the threshold of 69 were identified by the teacher as requiring services for the mentally retarded and many children with EFSIQ scores below the threshold were not identified. What seemed to account for these differences was disruptive and inattentive behavior in the classroom.

Another important finding is that even though there was little agreement between sets of indicators in identifying children who may be potential candidates for special resources for the handicapped, there was a consistent pattern of identification found across socioeconomic groups for many handicapping conditions. That is, far more children from low income families were identified by indicator sets in these data than were children from high income families. This was particularly true for parent indicators related to health and behavior patterns of children who may be hearing impaired, mentally retarded, or emotionally disturbed and for those recommended by teachers for services for "slow learners."

For children identified as possible candidates for speech therapy, there was a dramatic decline across age in rates of identification using various indicators of possible need, suggesting a strong differential need across age, with young children requiring special services at a far higher rate than older children.

For many children actually receiving services for the handicapped using the NCHS data, it was difficult to identify a specific handicapping condition other than the fact that children in special classes were often performing below the mean in math, reading, and on measures of IQ. Only about half of the children actually receiving services for the handicapped were found to have conditions of the type which would have been identified by indicators established in this report.

Thus, the estimated need for special services for the handicapped is highly dependent upon definitions and expectations, and the target population can fluctuate dramatically depending upon definitions applied. If the intent is to serve only the most severely handicapped, then definitions can be narrowly applied and the target population will be quite small. However, as the definitions expand to include more categories of handicaps and levels of severity, the target population can also be expected to expand. The expansion may be hard (or impossible) to control as definitions become ambiguous and all inclusive.

- The findings point to the difficulty of trying to apply a good deal of information about children as predictors of need for special resources, as well as the difficulty of obtaining consensus across indicators even with extensive information. The somewhat surprising lack of overlap among different indicator sets, coupled with the finding that approximately four percent of teacher identified children were recommended for two or more special resources offers one explanation of why current (1977-78) children counts from the states--required under P.L. 94-142--are lower than originally projected.
- These findings strongly suggest a need to refine the current clasification scheme used to define the handicapped population under P.L. 94-142 in order to clarify the kinds of children that are to be served under this new federal legislation. This is an essential task in assuring comparability of identification across states as well as to aid in the successful implementation, monitoring, and enforcement effort of the Office of Education
- The findings underscore the importance of the federal requirement for multiple assessment of children prior to placement in special education programs. Single indicators of need for special education services--whether teacher, parent, or test assessments--should be highly suspect.

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SRI staff members who made substantial contributions to the research were Norman B. McEachron, Systems Analyst, who aided in the early conceptualization and design of the study; Chris Cooper, Research Assistant, who assisted with the data analysis; and Patricia E. McCall, Programmer, who provided special assistance in generating standard errors for statistical analyses, a particularly complicated task due to the pseudoreplication techniques required by these data.

The principal consultants who assisted us in developing indicators from parent, medical, and other sources in the sample, suggesting the possible indication of a handicapping condition, were Suzanne L. Horowitz, Ph.D. and Henrietta G. Parkman, M.D. Dr. Horowitz is an experienced clinical psychologist who has worked in the Child Psychiatry Clinic at Stanford University Medical Center. She is knowledgeable in testing and evaluating children and adolescents with medical, emotional, and learning difficulties, and consults privately with children and their families. Dr. Parkman, a child psychiatrist, has worked with the Child Psychiatry Department at Stanford University Medical School, Agnews State Hospital, and the Santa Clara County Mental Health Clinic in Santa Clara, California.

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I INTRODUCTION

This is the second volume of a two-volume study of handicapped students, exploring the characteristics of students recommended for special education resources. The Educational Policy Research Center (EPRC) study of handicapped children explores the findings of a national survey of children conducted by the National Center for Health Statistics, findings that have only recently become publicly available, to determine the extent to which these data can be used to answer some of the policy issues raised by new federal legislation.

Identification of handicapped students takes on extreme importance because of the 1975 passage of Public Law 94-142, "Education for All Handicapped Children Act." The estimated potential funding level of the new law is approximately $4 billion, a level of support far higher than the $660 million potential funding level of the original act. The new legislation commits the federal government to a significantly new role, emphasizing support of service delivery in the provision of special educational services by the states rather than the previous "capacity building" role that provided a relatively small amount of federal money to serve as a program catalyst. The legislation has no expiration date, implying an intent that this be a permanent federal commitment.

The new federal role has four major objectives:

(1) To assure that all handicapped children have available a free, appropriate public education which emphasizes special education and related services designed to meet their unique needs.

(2) To assure that the rights of handicapped children and their parents or guardians are protected.

(3) To assist states and localities in providing education for all handicapped children.

(4) To assess and assure the effectiveness of state efforts to educate handicapped children.

Under the new federal mandates [P.L. 94-142, Section 3(C)] local education agencies are required to show that identification procedures are not discriminatory; that children are being served in "least restrictive" learning environments; that adequate "child-find" procedures are being practiced; and that adequate cost accounting procedures are being used so that the state's excess cost for special education can be determined. At present, there is a wide variation in the capacity of states to fulfill these requirements. Perhaps most important to the overall effectiveness of the legislation (in terms of the government's ability to implement, monitor, enforce, and evaluate the program) is the fact that the target population has not yet been adequately defined or identified.

How the eligible population is defined and identified are not only basic elements in the implementation process but also have important budgetary consequences for both the state and federal governments. Currently, however, there are no universal definitions for identifying handicapped children that are agreed upon by all states, thus, attempts to estimate the incidence of handicaps have been subject to great public controversy and debate. Because of state variations in defining and in reporting their handicapped populations, there is wide disagreement regarding how many children are receiving special educational services, how many need services but do not receive them, and how many children have been excluded from schools altogether because of physical or mental conditions. There has been little empirical data to aid in addressing the important issues of targeting and other related questions, such as the range of severity that exists, and whether there are differences in prevalence rates that should be taken into account because of income, race, or region of the country where a child resides. Because of these problems, estimates of incidence of all handicaps among school-age children have ranged from slightly over 8% to well over 30% (see Table 1). If the lowest and highest prevalence rates in each handicapped category are selected from Table 1, the overall rates vary between 6.96% and 38.6%.*

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*This figure is estimated excluding the special health category which since 1970 has been included with the orthopedically handicapped.

Table 1

SELECTED ESTIMATES OF THE PERCENT OF SCHOOL-AGE HANDICAPPED CHILDREN, OUTSIDE OF INSTITUTIONS

		Handicap									
Source[*]	Year	Visual	Hearing	Speech	Orthopedic	Special[†] Health	Emotional Disturbance	Mental Retardation	Learning Disability	Multiple Handicapped	Total %
Mackie	1954	0.20	1.50	2.0	1.50	1.50	2.0	2.00	n.a.	n.a.	10.70
Mackie	1963	0.90	0.58	3.5	1.00	1.00	2.0	2.30	n.a.	n.a.	10.47
BEH[‡]	1968	0.10	0.58	3.5	0.50	n.a.[§]	2.0	2.30	1.00	n.a.	9.98
Mackie	1969	0.10	0.60	3.5	0.75	0.75	2.0	2.30	n.a.	n.a.	10.00
Rossmiller	1970	0.05	0.10	3.6	0.21	n.a.	2.0	1.54	1.12	0.07	8.69
BEH	1970	0.10	0.58	3.5	0.50	n.a.	2.0	2.30	1.00	0.06	10.04
Fleischmann (1)	1970	0.10	0.58	3.5	0.50	n.a.	2.0	2.30	26.00	0.06	35.05
Fleischmann (2)	1970	0.10	0.58	3.5	0.50	n.a.	2.0	1.54	1.00	0.06	9.28
Taylor	1973	0.20	0.57	3.5	0.50	n.a.	2.0	3.03	2.50	0.06	12.38
BEH	1974	0.20	0.57	3.5	0.50	n.a.	2.0	3.00	2.50	0.06	12.35
Froomkin	1972	1.65	0.50	3.9	0.49	n.a.	1.3	2.10	1.00	--	10.94
BEH	1976	0.10	0.58	3.5	0.50	n.a.	2.0	2.30	3.00	0.06	12.04

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[*] All references appear in the bibliography.

[†] Since 1970 this classification has been included with orthopedic.

[‡] BEH = Bureau of Education for the Handicapped.

[§] Not applicable.

(1) Liberal estimate combining 1968-69 OE figures with learning disabilities estimates from James J. McCarthy and Joan F. McCarthy, Learning Disabilities (Boston: Allyn and Bacon, 1970). This represents the highest possible estimate for brain injured, brain dysfunction, and learning disabled students from the relevant literature.

(2) Conservative figure used in New York State.

The early estimates suggested by Mackie et al. (1954) have often been quoted in the absence of other data, and have formed the basis for estimating prevalence and need over the past 20 years. Mackie acknowledged that there had been a lack of methodological rigor in generating the estimates. Essentially, the rates came from estimates of experts in special education rather than being based on actual population surveys of children.

With the establishment of the Bureau of Education for the Handicapped (BEH) in 1968, an attempt was made to refine these rates through state reporting surveys of the number of handicapped children served and those estimated to be unserved. Yet, this method proved unsatisfactory for several reasons. First, wide variations in state programs and in classifying children as being handicapped precluded comparability across states. Second, some states, in reporting need, appeared to have adopted the Mackie rates as a basis for their state estimates.

Third, estimates of the target population have been made using fixed prevalence rates. This assumes that all handicaps are distributed evenly across age and racial groups, across family income levels, and across other socioeconomic dimensions. However, there is some evidence that assumptions of uniform distribution are probably incorrect. Disproportionate placement of children from low-income families and non-White ethnic backgrounds in classes for the mentally retarded and emotionally disturbed has been documented by numerous studies. At the same time, environmental conditions including poor nutrition and greater exposure to lead poisoning have been shown to produce a higher incidence of handicaps among these groups (Baer, 1972; Goodman et al., 1956; Hurley, 1968; Needleman and Shapiro, 1974; Neer et al., 1973; Pueschel, 1974; Sachs, 1974; Sholtz et al., 1973; Wallace, 1973).* Thus, there is a strong likelihood of differential incidence even though its extent remains unclear.

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*References appear in the bibliography.

Fourth, applying fixed prevalence rates across all age groups assumes that handicaps, as they relate to the need for special educational services, are not ameliorated either by schools or through normal maturation. This assumption is likely to be false for speech handicaps and possibly for other conditions as well. The NCES-BEH study of 1970, which differentiated elementary and secondary school needs for special services, reported that 6.1% of students at the elementary level were identified as requiring speech therapy, in comparison with only 1.1% of secondary school students. Whether speech problems decline as a result of therapy offered by the schools, by normal maturation, or by a combination, the need for speech services declines smoothly and significantly through the school grades, as reported by EPRC Research Note 19 (1975).

The lack of standardized national data has been emphasized by earlier studies. In 1974, the Rand Corporation published a study of services for the handicapped school-age population, "Improving Services to Handicapped Children," by J. S. Kakalick (1974). This study focused on delivery mechanisms and discussed prevalence only in terms of existing data. It concluded that no reliable data existed that could provide comparability across states.

Most recently, a report known as the "nine states study" was produced jointly, at the request of Congress, by the Office of the Assistant Secretary for Planning and Evaluation (ASPE) and the National Center for Education Statistics (NCES). The purpose of the study was to survey selected states to determine the availability of information on both the number of children in special education classes and the associated costs. The study concluded that standard and complete information could not be obtained from the states. Therefore, at least for the short term, it was impossible to base national planning efforts on state reports.

Since the allocation formula in P.L. 94-142 is based on the number of handicapped children being served in each state, both the magnitude and validity of the estimates take on added importance. For the present, Congress has limited the number of children that states may identify to no more than 12% of their total school age population (5-17 years old).

But, 12% may be too low (or too high) to meet the legislative intent to serve all children in need of special educational services. Congressional hearings have also helped to spotlight deficiencies in the availability of reliable information on handicapped children. In spite of the strong movements toward "mainstreaming," nonlabeling, and the nonclassification of children, it is still important to establish a reliable baseline estimate of the target population. Such a baseline is needed at both the national and state levels for monitoring, enforcement, and evaluation.

II STUDIES OF HANDICAPPED STUDENTS

In this and the prior volume, findings are presented from analyses of data collected by the National Center for Health Statistics (NCHS) on a national sample of children.* These data contain extensive health, behavioral, and school-related information on noninstitutionalized children between the ages of 6 and 17 years living in the United States. The purpose of the EPRC studies is to describe the characteristics of students who have been recommended by teachers as needing special educational resources.

Volume I reported on patterns of socioeconomic status and demographic variations of 14,185 students, ages 6-17, recommended by teachers as requiring special education resources for hearing, vision, mental retardation, emotional disturbance, orthopedic, and speech handicaps. The major findings of Volume I were that for all groups of children at the elementary school level who were recommended for special resources, those from low-income families were far more likely to be recommended for special resources than children from moderate- or high-income families. Additionally, it was found that Black elementary school children were recommended at a rate that was more than twice that of their White peers.†

Volume II extends the work of Volume I by using the NCHS data to explore variations in rates and the characteristics of children selected as possibly needing special education resources on the basis of various indicators of need. We have compared the population recommended by teachers as needing special educational resources with indicators developed from medical examination findings, school behaviors, test scores, developmental histories, and parent responses about home behaviors. We have also compared differences in indicator rates for students receiving special educational resources, those for whom resources were available but not used, and those for whom resources were recommended but not available. Particular questions of interest in this second volume are:

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*Volume I includes a sample of over 14,000 6-17 year olds and Volume II examines data on over 7,000 6-11 year olds.

†These findings were based on analyses of unpublished cross tabulations performed for the EPRC by NCHS.

- What is the variation in rates of possible handicapping conditions using different indicators of need?
- How much agreement is there between populations defined by the different sets of indicators?
- How do patterns of identification, based on these indicators, compare across socioeconomic and demographic characteristics; school and home behaviors; developmental histories; and school achievement?

This ability to evaluate differences in perceived needs based on the use of multiple indicators is particularly important given the new federal mandates for multiple assessment of special need. While actual school identification and placement practices may have changed since the mid-1960s, health, behavioral, IQ, and achievement patterns have not changed significantly during this period. Therefore, the rich NCHS data base provides a unique opportunity to explore standardized, comprehensive information on a large, nationally representative sample of children. It has been possible to compare children who, at the time of the survey, were recommended for and were receiving special educational resources with children who were not recommended for such resources. The special resources considered in this current volume are those for: hearing loss, vision handicap, speech disturbances, orthopedic handicaps, slow learners, mental retardation, and emotional disturbance. The sample includes children in public, private, or parochial schools but excludes children in institutions. The following section describes in greater detail the National Health Examination data base used in these studies.

The National Health Examination Survey of Children and Youth

The NCHS survey, part of a Congressionally mandated series of studies on the health of the nation, was carried out between 1963 and 1970, gathering school-related information as well as data on health and behavioral characteristics for a total sample of 14,185 randomly selected, noninstitutionalized individuals. Two independent samples were selected (approximately 8,000 6-11 year olds and 8,000 12-17 year olds) in cooperation with the U.S. Bureau of Census so that they would be representative of the total 6- to 17-year old continental U.S. population with respect to age, sex, race, and characteristics of the place of residence, including region of the country, and population size and growth.

Extensive information was collected on each individual in the two samples. Sources included a medical examination by a pediatrician; vision and hearing tests given by specially trained technicians; individually administered achievement and psychological tests given by a psychologist; teacher assessments of special educational need(s), school behavior, and performance; parental assessment of early childhood development, medical history, and current behavior patterns; and, in the case of those aged 12 to 17 years, personal assessments of their health and development.

The survey was conducted in two cycles, Cycles II and III. (Cycle I, conducted in the early 1960s, surveyed the adult population.) Between 1963 and 1965 information was gathered on those aged 6 to 11 years, and between 1966 and 1970 on those aged 12 to 17. The response rates for both survey cycles were extremely high, with a 96% response from teachers assessing those in Cycle II and 92% response from teachers assessing those in Cycle III. Careful methodological controls were used to minimize biases and nonsampling errors.

The NCHS data are unique in that they provide a reliable national data base that contains:

- School recommendation of special need for seven major special education resources covered with uniform reporting methods. These include resources for vision, hearing and speech problems, and for the slow learner, orthopedically handicapped, mentally retarded, and emotionally disturbed.
- Data providing multiple assessments of individual subjects.
- Data based on a large, random, representative, national sample.

- Sophisticated statistical methodology which provides standard errors of estimates for the projected rates.
- Data standardized across geographic regions.

Until now this data source has not been publicly available for analyses. While the results of the survey have been reported in part in a series of NCHS publications (see bibliography of this report), cross tabulations of individual variables have not been reported extensively by NCHS. Thus, the usefulness in the past for using the published data to delineate characteristics of the potential school age, handicapped population has been very limited.* At the time Volume I was prepared the data were still not public and our analysis was based on unpublished cross tabulations performed for the EPRC by NCHS. The Cycle II data on the 6-11 year old population, which has recently become available, provides the basis for this current study. The information from the Cycle II HES used in these analyses is described below.

General Population Characteristics of the 6-11 Year Old Population

The data for each child in the HES sample have been inflated to characterize the larger group of children of which the child is representative, using the NCHS weighting procedure to present national patterns and rates.† The high percent of sampled children who were actually examined (96%) and the low differential in this rate between demographic groups are strong evidence that nonresponse bias on the examination was minimal.* Of those children examined (see Table 2) about 5% had no school questionnaire data on file. Of those who had no school information, approximately 180,000 (about 0.8% of the total sample) were not in school. The remaining children for whom there was no school information (about 4% of the total sample) were in school but had no school questionnaire data. Table 3 tabulates the percent distribution on selected demographic characteristics of children in school with school data, those in school without school data, and those not in school. Over 55% of the children in school with no school data were from rural areas, while for those who had school data, only 34% were from rural areas. Of the children in school without school data, 45% were from families whose incomes were below $5,000, while for those who had school data, only 35% were from families with incomes below $5,000. Of the children not in school, 85% were 6 years old.†

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*In 1972, Joseph Froomkin, Inc. prepared a report for the President's Commission on School Finance titled Estimates and Projections of Special Target Group Populations in Elementary and Secondary Public Schools, in which he used an early NCHS publication reporting Prevalence of Selected Impairments. However, this early publication by NCHS was based on limited household interviews only, and included adults as well as children.

†The weights used in this estimation process were provided by NCHS. Use of these weights increases precision by bringing survey results in closer alignment with the known U.S. population, in terms of race and sex within single years of ages 6-11. For more detail regarding sampling procedure and weighting methods see Appendix A and also Vital and Health Statistics Publications Series 2, Numbers 14, 31, and 43.

The NCHS survey tabulated only three categories for race: Negro, which included Blacks; White, which included Whites and latinos (no distinction was made among Mexican-Americans and other Hispanic-background groups); and "other" which included American Indians (but not Mexican-Americans), Chinese, Japanese, and all other races not white or black (e.g., Polynesian, East Indian). Because the "other" category was only 0.4% of the total sample, and because it was impossible to isolate specific ethnic categories within the "White" category, this study has considered only two groups of children: "Black" and "White," with the "White" category including all others except Blacks.

For all children, both those in school and those not in school, multiple assessments were available. Each of the assessments used in

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*For a detailed discussion of sampling bias, see Plan, Operation and Response Results of a Program of Children's Examinations, NCHS Publication Series 1, No. 5.

†Section VII discusses the characteristics of the population not in school.

Table 2

MAKE-UP OF THE NCHS DATA BASE FOR AGES 6-11 YEARS EXTRAPOLATED TO THE ENTIRE POPULATION

	Percent	Number (hundreds of thousands)
TOTAL	100%	237.8
Sex		
Males	50.8	120.8
Females	49.2	117.0
	100.0%	237.8
Race		
Black	13.8	32.7
White (including "other")	86.2	205.1
	100.0%	237.8
Family income		
Under $3,000	18.3	43.5
$3,000-$4,999	17.9	42.5
$5,000-$6,999	22.3	53.0
$7,000-$9,999	20.3	48.2
$10,000-$14,999	11.7	27.8
$15,000 and over	4.6	10.9
Don't know/No response	5.0	12.0
	100.1%*	237.9*
Age		
6 years	17.2	41.0
7 years	17.2	40.8
8 years	16.8	39.9
9 years	16.6	39.6
10 years	16.3	38.7
11 years	14.9	35.6
12 years (by end of study)	1.0	2.4
	100.0%	238.0*
Region of the country		
Northeast	22.5	53.6
Midwest	28.4	67.6
South	24.2	57.5
West	24.9	59.1
	100.0%	237.8
Type of place		
Rural	34.6	82.3
Urban, under 50,000 people	14.8	35.1
50,000-250,000 people	7.3	17.4
250,000-3 million people	24.7	58.7
Over 3 million people	18.6	44.3
	100.0%	237.8

---

*Does not add due to rounding.

Table 3

POPULATION CHARACTERISTICS[*] OF CHILDREN IN SCHOOL AND NOT IN SCHOOL IN THE NCHS DATA BASE EXTRAPOLATED TO THE ENTIRE POPULATION

	Percentage			Number (hundreds of thousands)		
	In School			In School		
	With Data	Without Data	Not in School	With Data	Without Data	Not in School
TOTAL	100%	100%	100%	226.8	9.2	1.8
Sex						
Males	50.9%	51.8%	55.7%	115.4	4.4	1.0
Females	49.1	48.2	44.3	111.4	4.8	0.8
	100.0%	100.0%	100.0%	226.8	9.2	1.8
Race						
Black	13.7	15.2	12.5	31.1	1.4	0.2
White (includes "other")	86.3	84.8	87.5	195.7	7.8	1.6
	100.0%	100.0%	100.0%	226.8	9.2	1.8
Family income						
≤$3,000	17.9	24.4	43.6	40.5	2.3	0.8
$3,000-$4,999	17.7	20.4	25.5	40.1	1.9	0.5
$5,000-$6,999	22.4	21.8	13.3	50.7	2.0	0.2
$7,000-$9,999	20.5	15.8	7.6	46.6	1.5	0.1
$10,000-$14,999	11.9	8.1	-- [‡]	27.1	0.7	-- [‡]
≥$15,000	4.7	3.1	-- [‡]	10.6	0.3	-- [‡]
Don't know/No response	4.9	6.4	10.0	11.2	0.6	0.2
	100.0%	100.0%	100.0%	226.8	9.3[†]	1.8
Age						
6 years	16.5	22.3	85.4	37.4	2.1	1.6
7 years	17.1	19.7	9.7	38.8	1.8	0.2
8 years	17.2	8.8	-- [‡]	39.1	0.8	-- [‡]
9 years	16.7	17.9	1.4	37.9	1.6	0.03
10 years	16.5	13.0	2.0	37.4	1.2	0.04
11 years	15.0	17.4	1.5	33.9	1.6	0.03
12 years	1.0	0.9	-- [‡]	2.3	0.1	-- [‡]
	100.0%	100.0%	100.0%	226.8	9.2	1.9[†]
Region						
Northeast	22.6	23.3	4.2	51.3	2.1	0.1
Midwest	28.7	24.5	9.7	65.2	2.3	0.2
South	23.9	29.7	30.8	54.2	2.7	0.6
West	24.7	22.5	55.3	56.0	2.1	1.0
	99.9%[†]	100.0%	100.0%	226.8[†]	9.2	1.9[†]
Area population						
Rural	33.6	55.3	49.8	76.3	5.1	0.9
Urban, under 50,000	15.0	7.6	21.3	34.0	0.7	0.4
Urban, 50,000-250,000	7.3	6.4	9.4	16.7	0.6	0.2
250,000-3,000,000	25.3	12.2	16.5	57.3	1.1	0.3
Over 3 million people	18.8	18.5	3.1	42.5	1.7	0.1
	100.0%	100.0%	100.1%[†]	226.8	9.2	1.9[†]

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[*] Defined in Appendix A.

[†] Does not add due to rounding.

[‡] No observations in category.

this volume is discussed briefly below. (For a more complete description of the assessment procedure, see Appendix B.)

School Questionnaire

School information was collected on 96.2% of the children attending public, private, or parochial schools. The school questionnaire contains assessments of the child's academic and intellectual ability, classroom and interpersonal behaviors, social adjustment, and the teacher's perceived need for special educational resources. Special educational resources for handicapped children were recommended for 26.6% of all the children sampled (see Table 4).*

Background Characteristics

The household questionnaire provided demographic and SES data on each child in the survey. The NCHS population distribution for each socioeconomic and demographic variable examined in the study is presented in Table 2.

Parent Questionnaires

Parents of children in the HES were asked to complete two questionnaires. The first, a self-administered form, provided information about the child's medical history and current health status. Another questionnaire, administered by the HES interviewer, provided information about the parent's assessment of the child's behavior and interpersonal relations at home.

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*Of the total school population, 4% were identified as requiring "other" resources(s). However, since information regarding the nature of "other" resources was not available either on the data file or from NCHS, this category of special resource was not included in this study.

Table 4

NEED, AVAILABILITY, AND USE OF SPECIAL SERVICES/SPECIAL RESOURCES RECOMMENDED BY TEACHERS--1966

a. Percent of Children for Whom Special Resource Was Recommended

Specific Problem for Which Resource Was Recommended	Percent
Hard of hearing	1.0%
Sight-saving	1.4
Speech therapy	6.2
Orthopedic handicap	0.3
Slow learner	13.1
Mentally retarded	1.2
Emotionally disturbed	3.4
Subtotal	26.6%
None	73.4
Total	100.0%

b. Use and Availability of Special Resources for Those Who Were Recommended

Specific Problem or Resource Recommended	Resources Available and Used	Resources Available, Not Used	Resources Not Available	Total
Hard of hearing	33.9%	14.4%	51.7%	100%
Sight-saving	35.2	14.3	50.4	99.9%*
Speech therapy	47.4	19.2	33.4	100%
Orthopedic handicap	44.1	23.0	32.9	100%
Slow learner	29.4	13.6	56.9	99.9%*
Mentally retarded	65.4	15.7	18.9	100%
Emotionally disturbed	22.2	22.6	55.1	99.9%*

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*Does not add due to rounding.

Physical Examination

A standardized physical examination given by a physician was completed for each child in the survey. The exam covered the following areas:

- An overall inspection including observed physical deformities, temperature, observation of gait, and observations of general appearance such as tics, nail biting, thumb sucking, etc.
- An examination of joints and muscles for which the physician noted any abnormality in the performance of specific movements.
- An eye examination including inspection for styes, crossed eyes, etc.
- An ear, nose, and throat examination, and a cardiovascular examination in which measures of blood pressure, heart sounds, and an electrocardiogram were taken.

Vision and Audiometry Tests

Standard vision and audiometry tests were administered to all sample children by specially trained technicians. Details of these examinations and the conditions under which they were administered can be found in Plan, Operation, and Response Results of a Program of Children's Examinations, Series 1, No. 5.

Psychological Examination

A battery of achievement and psychological tests was individually administered to each child in the sample. Because this information was collected independently, test data are available for children who were not in school as well as for children in school for whom other school data were not available. The following tests were administered:

- Vocabulary and Block Design subtests from the Weschler Intelligence Scale for Children (WISC).
- Harris-Goodenough Draw-a-Person Test.*
- Arithmetic and Reading sections of the Wide Range Achievement Test (WRAT).

A brief description of each test and its use is given in Appendix C.

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*Not used in this study.

Analytic Scope of the EPRC Study

In this volume, we have concentrated on the population of children in school for whom school information was available. This is a slightly smaller group than the overall sample. Only in Section VII is there a discussion of the characteristics of children out of school.

The NCHS study was not constructed to directly address the need of a child for special educational resources, except in the school questionnaire. It would have been desirable if the medical examinations, tests, and parent interviews had also addressed the point directly. In the absence of any such direct information, it was necessary to select items from the survey that could be used as indicators either of the need for special resources or of the possibility that such a need could exist. For example, information provided by a parent that a child did not say a real word until after age one-and-a-half is not by itself an indicator of a handicapping condition; however, when combined with information about very low birth weight and ill health at age one, the possibility of developmental damage is raised significantly. An audiometric test for hearing is a much more clear-cut indication of hearing difficulties than a teacher's request for special resources for the hearing impaired or a parent noting a hearing problem, but even an audiometric test is not final proof, since some hearing difficulties are transitory.

Our approach in selecting sets of indicators of actual or potential handicaps was to make a careful examination of the NCHS data file description, and ask a number of consultants (psychologists, pediatricians, and handicap specialists) to help us put together sets of variables that would be useful in establishing possible need for special services. It must be stressed that the variables selected as indicators of possible need are not necessarily criteria for determining whether or not a handicap exists. Thus, this study is not an attempt to validate or estimate the incidence of particular handicaps among children aged 6 to 11 years. Instead, this study compares the characteristics of children who may need special educational resources, and explores the relationship among numerous factors commonly thought to be associated with handicapping conditions.

The NCHS data file is the most comprehensive data base currently available for such a study, and contains many details and measurements of individual children that relate to the developmental process.

The data on the NCHS file used to define the indicators were divided according to source: the pediatrician who performed the medical examination; the adult who supplied the medical history; and tests of vision, hearing, and aptitude. Because of the differences in the type of data generated from each source, separate indicators were created when possible. Table 5 presents the types of indicators established for each handicap identification, based on available data. The specific components of the indicators used are discussed separately in the sections dealing with each handicap.

Table 5

TYPES OF INDICATORS OF POSSIBLE HANDICAP

Handicap Type	Medical Examination	Test	Parent Responses
Orthopedic	X	*	X
Vision	X	X	*
Hearing	X	X	X
Mental retardation	X	X	X
Slow learning	*	*	*
Emotional disturbance	X	*	X
Speech	X	*	X

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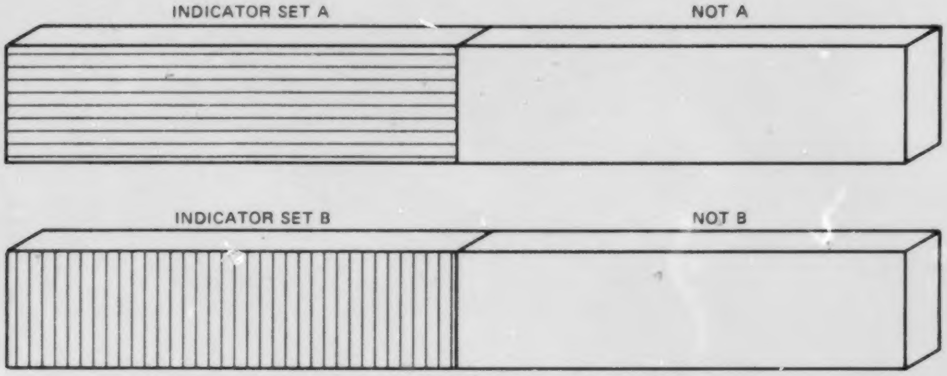
[*] No appropriate indicators of this type of handicapping condition were discovered in the data file.

No data in the NCHS file were deemed satisfactory for identifying a child as a slow learner. Therefore, in Section IV we have described the various characteristics of children identified by teachers as slow learners in terms of their behaviors, test scores, and distributions across socioeconomic variables.

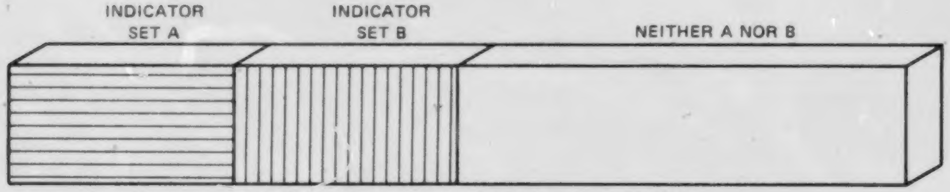
The analysis of the NCHS data, presented in the following sections consists of tabulations of the rates at which there was an indication of possible need for special resources based on each established set of indicators. The rates are expressed as the percent of children in a particular population. The relative rates, across selected demographic and socioeconomic characteristics are described by tabulating the percent distributions of children who were identified as needing special resources. These categories include race, sex, income, age, region, and size of place of residence.

Interpretation of Findings

In examining these data we were concerned not only with overall and relative rates of identification based on different sets of indicators, but also the extent to which there was agreement between the various indicators of possible need. Overall rates may appear to be similar, but little agreement may exist as to which children have been identified. For example, the estimated rates using two different sets of indicators may both be exactly 4%, and yet the two sets of children identified can be mutually exclusive. Therefore, the agreement between identification indicators was assessed by tabulating the percent of children identified by each set of indicators alone, the percent identified by both sets of indicators, and the percent identified by neither set. The possible relationships are illustrated by Figure 1. Figure 1(a) shows the separate application of each of two hypothetical indicator sets. In Figure 1(b)-(d), the indicator sets are jointly applied. Figure 1(b) shows the situation where two sets of indicators identify totally different groups. Figure 1(c) shows the situation where all of the group identified by one set of indicators (Set B) are also identified by the other set of indicators (Set A), but some of the group identified by Set A are not identified by Set B. Finally, Figure 1(d) presents the situation where some of the total population are identified by both sets of indicators (represented by the cross-hatched area) while others are identified by only one set of indicators (either A or B) or by neither set of indicators.


INDICATOR SET A
NOT A
INDICATOR SET B
NOT B

(a) SEPARATE APPLICATION OF INDICATOR SETS


INDICATOR SET A
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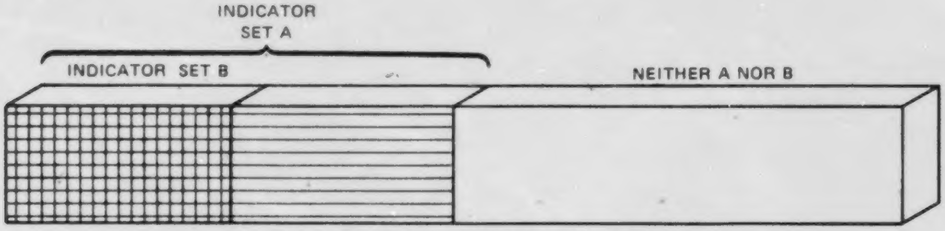
NEITHER A NOR B

(b) JOINT APPLICATION OF INDICATOR SETS THAT IDENTIFY MUTUALLY EXCLUSIVE GROUPS


INDICATOR SET A
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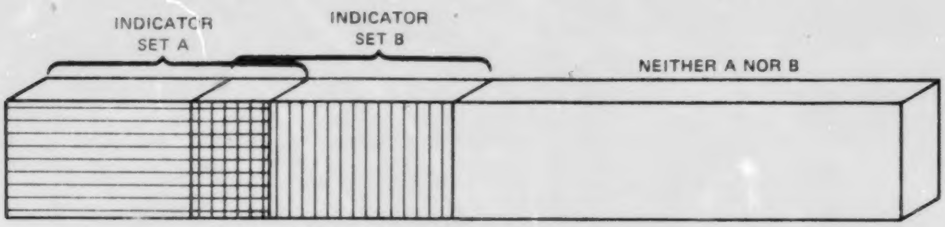
NEITHER A NOR B

(c) JOINT APPLICATION OF INDICATOR SETS WHERE B IS MORE STRINGENT THAN A


INDICATOR SET A
INDICATOR SET B
NEITHER A NOR B

(d) JOINT APPLICATION OF INDICATOR SETS WHERE A AND B OVERLAP

FIGURE 1 ILLUSTRATION SCHEME USED TO DESCRIBE THE EXTENT OF OVERLAP BETWEEN TWO IDENTIFIED POPULATIONS

The total population identified by one or more sets of indicators can then be analyzed as shown in Figure 2. In the example presented in Figure 2, 12% (5% + 7%) of the total population are identified by indicator Set A, and 15% (7% + 8%) by indicator Set B, while 7% are identified by both A and B. Of the total population, 20% (5% + 7% + 8%) are identified by at least one indicator set and 80% are not identified by either indicator set. Note that of the group identified by indicator Set A (12%), 58 of every 100 (or the identified 7% of 12%), were also identified by indicator set B. The total identified group (20%) is further detailed in the diagram extended by dotted lines. Note that 25% of the total identified population are identified only by Set A and 40% are identified only by Set B, while 35% are identified by both indicator sets. As illustrated in the upper bar, the 35% represents more than half of the population identified by Set A.

The following discussion is intended for the nontechnical reader and explains some of the methodological aspects of the analyses performed on these data. The more technical reader may wish to turn to Appendix A for a more detailed statistical discussion.

The data in this report are based on a survey of children who were selected to represent the total population of children their age. Selection of a limited sample was necessary since a similar survey of the entire population would have been financially infeasible. However, all such sample surveys are subject to error from a variety of sources including errors of response and reporting, which would occur even if the entire population were surveyed, as well as errors which occur because observations were made only on a part of the population rather than the whole. NCHS took extraordinary care in the design and collection of these data to minimize many of the possible errors and biases that might occur.

Yet, the possibility of error is always present and raises questions about the extent to which conclusions based on analyses of sample data may be generalized to the total population it is intended to represent. A common statistical technique used to aid the researcher in evaluating

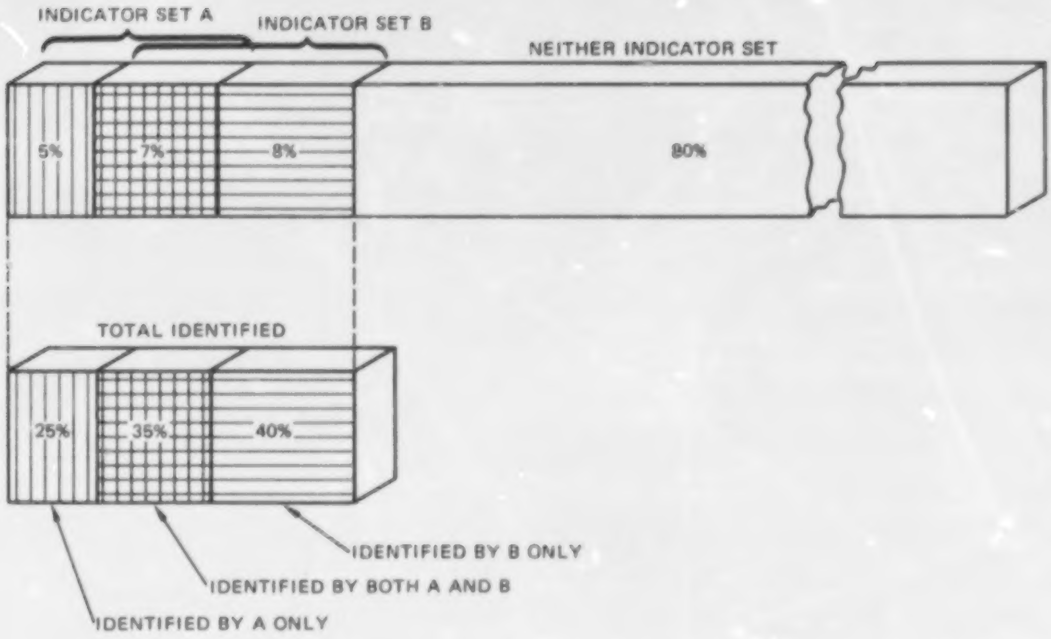

INDICATOR SET A
INDICATOR SET B
NEITHER INDICATOR SET
5%
7%
8%
80%
TOTAL IDENTIFIED
25%
35%
40%
IDENTIFIED BY B ONLY
IDENTIFIED BY BOTH A AND B
IDENTIFIED BY A ONLY

FIGURE 2 ILLUSTRATION SCHEME USED TO DETAIL AN IDENTIFIED POPULATION

the extent to which findings based on a sample may be attributed to the total population, is the generation and application of standard errors of estimate. The standard error of an estimate is a measure of the variation among the estimates from all possible samples that might have been selected from the whole population. Thus, the standard error is a measure of the precision with which an estimate from any single sample may be considered as representative of the average result that would occur if one had selected and surveyed all possible samples.

In this report standard errors were generated using a technique called "pseudoreplication," a method especially developed for use with data from complex surveys such as the NCHS survey. These standard error values were then used to perform approximate statistical tests on multiple pair-wise comparisons--using a significance level of .05. What this means is that one may have confidence that those differences between groups found to be "statistically significant" are true differences rather than being due to measurement errors. Thus, where a statistical test indicates a difference, one may have confidence that the difference is due to a real difference in the population itself.

In some cases, the rates displayed in this report are extremely low and the standard errors are equal to or larger than the estimated rates themselves. In such cases, the reported rates are of little value except to indicate that the true population is probably quite small. These cases have been noted in the tables and extreme caution should be exercised in making broad generalizations where very low rates are reported accompanied by large standard errors.

We are concerned that by reporting estimates based on various indicators developed and presented in this report, we may give those estimates a greater air of precision than they deserve. Because of this, we have tried to be careful in the presentation, interpretation, and generalization of findings. In spite of these precautions to the reader, the data are still of significant value for public policy purposes. For the first time, it is possible to compare a wide variety of factors across a large nationally representative sample of children, using uniform definitions and data to suggest variations in possible target populations.

The remaining sections present the findings of our analyses. Section III presents findings for the physical handicaps of vision, hearing, and orthopedic impairment; Section IV discusses findings for the mental handicaps of mental retardation and emotional disturbance; Section V describes differences between children with possible speech problems; Section VI discusses the multiply handicapped and children identified as slow learners; Section VII describes the characteristics of children not in school and compares them with their school peers; and finally, Section VIII presents overall conclusions.

III PHYSICAL HANDICAPS

The findings for physical handicaps are reported for three categories: hearing, vision, and orthopedic problems. Unlike Volume I in which hearing, vision, and orthopedic groups were combined, the findings for these categories have been presented separately in this volume because of the differences in observed rates when various independent indicators are applied.

Hearing

Definitions

In order to compare findings of various assessments made on each child, indicators were developed from the NCHS data base with the aid of consultants. These indicators of possible need for special resources for hearing handicaps are set forth in Table 6.

Audiometric tests were administered to the NCHS sample. In these tests, the speech reception threshold was taken as the average of the three pure tone frequencies (500, 1,000, and 2,000 cycles per second) most important for understanding speech. This method is a commonly accepted method for reporting speech threshold levels. This estimation procedure is recommended by the American Medical Association Committee on Medical Rating of Physical Impairment and by the American Academy of Opthalmology and Otolaryngology.

Using the indicators set out in Table 6, the overall rates of identification for children in school for whom data were available are shown in Figure 3.

Table 6

INDICATORS AND RISK FACTORS USED TO IDENTIFY CHILDREN AS POTENTIAL CANDIDATES FOR SERVICES FOR THE HARD OF HEARING

Teacher

In response to the question "If the following special resources were made available, check those you would recommend for this child," checked "Special provision for the hard of hearing."

Audiometric Test

A reading of greater than 50 dB (ASA) above audiometric zero for speech threshold in the better ear (severe hearing loss).

OR

A reading of 30 to 50 dB (ASA) above audiometric zero for speech threshold in the better ear (moderate hearing loss).

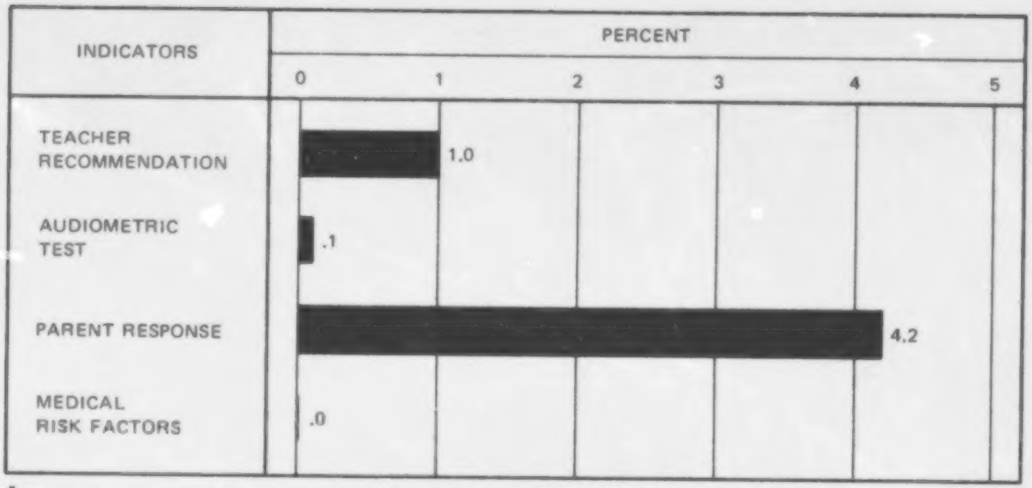
(See text and Appendix B for a discussion of the measurements made.)

Parent Responses

In response to the question "Does your child have any trouble hearing," checked "Yes."

Medical Findings

Any indication by the examining pediatrician of an "ear condition, including deafness."



*Estimated rates represent the population in school for whom school data were available. Estimated rates for children not in school are presented in Section VII.

FIGURE 3 RATES OF THE POTENTIAL NEED FOR SPECIAL RESOURCES FOR THE HEARING IMPAIRED, USING VARIOUS INDICATORS*

Comparison of Overall Rates

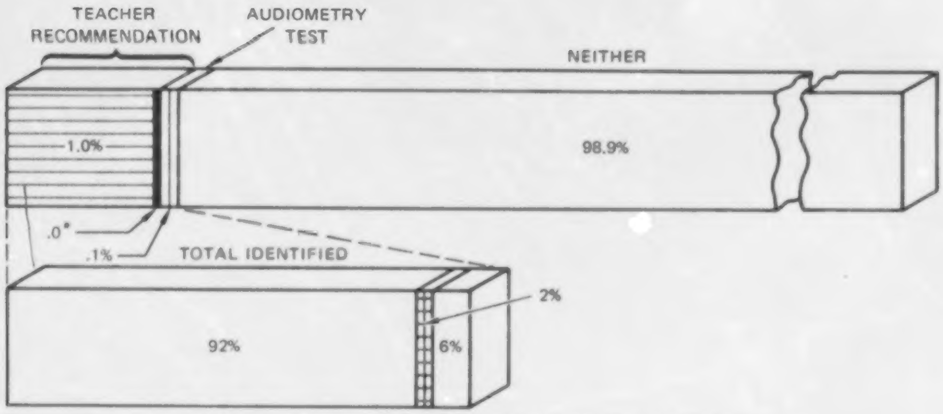
Using the indicators available in the NCHS data base, there appears to be very little agreement as to the estimated rate of children in the population who have hearing problems. The very broad question asked of parents produces a high rate relative to rates reported by either teachers, medical examination, or audiometric test.

Using the classification of hearing impairments developed by the American Academy of Ophthalmology and Otolaryngology, the rate at which children from the NCHS sample were identified as hearing-impaired by the audiometric test was very low. Only 0.1%, or approximately 20,000 children 6-11 years of age, were identified as having hearing losses of 30 decibels or more within the critical speech-frequency range. This level of loss is usually considered serious enough to require special attention, particularly in the early years of development.

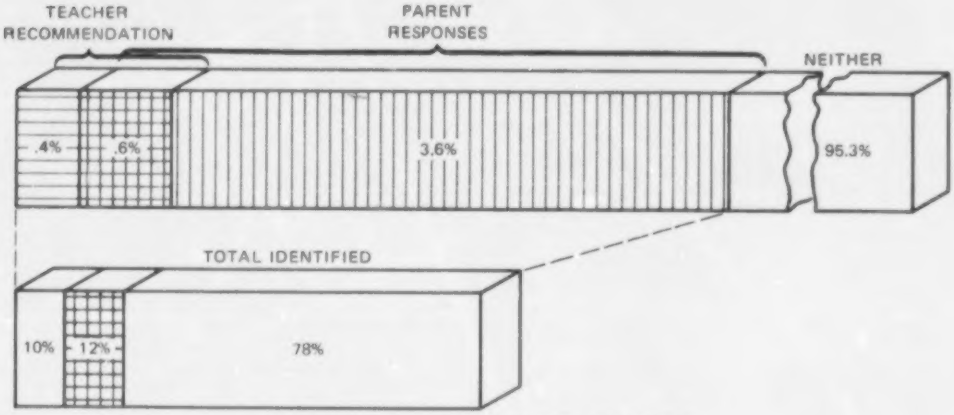
None of the children in the NCHS sample had impaired hearing to the point of being unable to understand even amplified speech, indicating that the incidence of deafness or severe hearing loss among children of this age is too small to measure even with the large sample size used in this survey. (See NCHS, Pub. Series 11, No. 102, p. 11.) It should be emphasized that these rates are for children attending regular public and private schools, and do not include children living in special institutions for the severely hearing impaired. Because the medical examination identified no children with physiological problems related to hearing loss, such problems must be relatively rare and therefore did not show up in this sample of children. Hence, we have omitted medical findings from the remaining discussion and comparisons.

Extent of Agreement Between Criteria

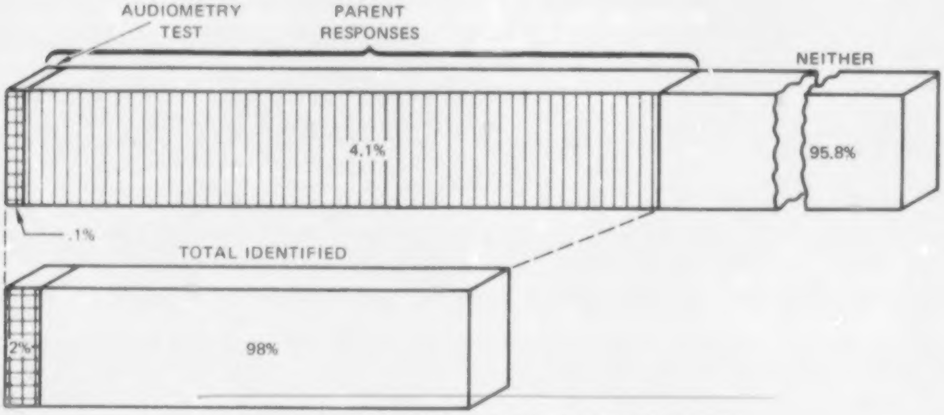
Of greater interest than overall rates is whether teachers, parents, and the audiometric test identify the same children. Figure 4 shows the extent of overlap between teacher recommendations, audiometry test results, and parent responses in identifying children as having hearing problems. As shown in Figure 4(a), the smallest overlap was between children who



(a) AGREEMENT BETWEEN TEACHER AND AUDIOMETRIC TEST



(b) AGREEMENT BETWEEN TEACHER AND PARENT



(c) AGREEMENT BETWEEN AUDIOMETRIC TEST AND PARENT

*Less than 1/10 of 1%.

FIGURE 4 IDENTIFICATION OF CHILDREN WHO MAY NEED SERVICES FOR THE HEARING IMPAIRED

had hearing loss as measured by the test and those who were also identified by the teacher as requiring special services for the hard of hearing. There was slightly more overlap between those children identified by both teachers and parents [Figure 4(b)]. The greatest consensus was between parents and the test [Figure 4(c)] where all but one child identified by the test were also identified by parents. This may be explained by the relatively large number of children who were identified by the parent criterion which increased the probability of dual identification.

These findings are supported by several studies that have looked at the identification of children having subnormal and normal hearing levels (as determined by audiometric study) compared with identification by both the classroom teacher and the parent (Exhibit 1). The studies suggest that reliance on audiometric examination findings in determining hearing loss is better than identification based only on teacher or parent observations. This is reinforced by the observed overlap in Figure 4(a)-(c). For example, in Figure 4(c), all of the children identified by the audiometry test have also been identified from parent responses. In Figure 4(b), on the other hand, little more than one-half of the teacher identified population were also identified from parent response. Finally, in Figure 4(a), only about one quarter of the children identified by the audiometric test were also identified by the teacher. Therefore, it must be concluded from the data that approximately 75% of all children identified by the audiometry test were not recommended by the teacher for special resources for the hearing-impaired, and as a consequence were excluded from such services. This represents about 15,000 children. Conversely, a large number of children were regarded by teachers as being hard of hearing when the audiometry test indicates that inability to hear well apparently was not the problem.

Availability and Use of Resources

Of the 1.0% of children recommended by teachers as needing special resources for the hard of hearing, 34% were reported as using such services while 14% had services available but were not using them and 52% did not have resources available. Table 7 shows the percentage of all

Exhibit 1

FURTHER READING ON IDENTIFICATION OF CHILDREN AS HEARING IMPAIRED

Curry, E. T., "The Efficiency of Teacher Referrals in a School Hearing Testing Program," *Journal of Speech and Hearing Disorders*, *15*:211-214 (1950).

Eagles, E. L., W. G. Hardy, and F. I. Catlin, *Human Communication: The Public Health Aspects of Hearing, Language and Speech Disorders*, U.S. Government Printing Office, Washington, D.C. (1968).

Geyer, M. L., and A. Yankauer, "Teacher Judgment of Hearing Loss in Children," *Journal of Speech and Hearing Disorders*, *21*:482-486 (1956).

Johnson, J. C., *Educating Hearing Impaired Children in Ordinary School*, Washington, D.C., Vola Bureau, 1962; and *Committee on Child Health: Services for Children with Hearing Impairment*, American Public Health Service, New York (1956).

Kodman, F., "Identification of Hearing Loss by the Classroom Teacher," *Laryngoscope*, *66*:1346-1347 (1956).

Kodman, F., P. E. Schneck, K. G. Stockdell, W. V. Thompson, and C. Spies, "Identification of Hearing Loss by Parents, Teachers, and Audiometers," *Eye, Ear, Nose and Throat Monthly*, *37*:103-105 (1958).

Kodman, F., "Socioeconomic Status and Observer Identification of Hearing Loss in School Children," *Exceptional Children*, *26*:176-188 (December 1959).

Quigley, S. P., "Some Effects of Hearing Impairment Upon School Performance" (mimeographed manuscript prepared for the Division of Special Education Services, Office of the Superintendent of Public Instruction for the State of Illinois), Springfield, Illinois, 1970.

Table 7

APPLICATION OF INDICATORS TO POPULATION FOR WHOM TEACHER HAD RECOMMENDED SPECIAL RESOURCES FOR THE HEARING IMPAIRED

Source of Identification	Percent of Total Teacher-Identified Group	Percent of Group Using Special Resources	Percent of Group Not Using Special Resources (Resources Available)	Percent of Group Without Resources Available
Parent Indicators:				
Identified	53%	64%	50%	43%
Not identified	47	36	50	57
Total	100%	100%	100%	100%
Audiometric Test:				
Identified	2	5	--*	--
Not Identified	98	95	100	100
Total	100%	100%	100%	100%

---

*No observations in category.

children recommended by teachers as requiring special resources for hearing that were also identified by parent responses and the audiometric test and compares these rates with children using special resources; children for whom resources were available but not used; and children for whom resources were not available. For children using special resources, 64% were identified by both the parent and teachers but only 5% were identified by both the audiometric test and the teacher. While all children recommended by teachers and identified by the test were receiving services in school, 95% of the children using special resources for the hearing impaired were not found in testing to have hearing impairments.

Home and School Behaviors

In discussions with audiologists from the Stanford University Hearing and Speech Clinic, it has been their experience that children who are shown to have hearing levels within the normal range based on audiometric testing do not require special resources for hearing handicapped children. Moreover, some children whose audiometric results indicate moderate hearing loss may not require special education resources. It is common for children to have fluid in their ears or middle ear infections that temporarily impair hearing but are self-remediating. About 80-90% of cases of moderate hearing loss based on measurements made within a single day can be expected to improve in this way. While children with difficulty understanding faint speech may require special classroom arrangements, the regular teacher is capable of making the adjustments needed. Therefore, the lack of any significant overlap between children recommended by teachers for special resources and those found in the audiometric screening is somewhat surprising. In an attempt to unravel possible explanations for the small overlap between teacher evaluations and other indicators, several health and behavioral characteristics were examined for various groups of children. These differences in profiles are presented in Table 8. It should be noted that the group of children identified by both teacher and audiometric test was so small that it is not possible to make any generalizations from the group profile. There appears to be a pattern among the

Table 8

SCHOOL BEHAVIOR AND DEVELOPMENTAL PROFILES OF CHILDREN RECOMMENDED BY TEACHERS TO RECEIVE RESOURCES FOR THE HEARING IMPAIRED, CHILDREN IDENTIFIED BY THE AUDIOMETRIC TEST, CHILDREN IDENTIFIED BY BOTH TEACHERS AND THE AUDIOMETRIC TEST AND CHILDREN IDENTIFIED BY NEITHER

	Neither Teacher nor Audiometric Test	Teacher Only	Audiometric Test Only*	Both Teacher and Audiometric Test*
Number (in hundred thousands)	224.2	2.3	.2	.04†
Mean EFSIQ (Standard Error)	96.3 (.63)	93.5 (2.04)	79.7 (5.91)	73.0 (0.00)
School Profile‡ (Teacher Ratings, %)				
Less attentive than most for his/her age	22.4% (.82)§	34.7% (7.01)	32.6% (37.22)	--**
Extremely restless for his/her age (constantly moving)	8.4 (.44)	8.1 (3.33)	32.6 (37.22)	--
Intellectual ability is clearly below average for age	18.7 (.66)	41.6 (7.19)	20.2 (31.93)	100.0% (0.00)
Health/Developmental Variables†† (Parent Ratings, %)				
Birth injury noted	.3	--	--	--
Poor health at age 1 year	1.6	6.0	17.5	--
Trouble hearing	3.7	53.1	87.6	100.0
Earaches noted	26.4	49.3	62.3	--
Learning speed is slower than for other his/her age	3.9	6.2	17.5	--
Spoke first real word after age 1.5 years	9.0	8.4	28.6	--

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[*] More than 30 db hearing loss.

[†] Sample too small to permit generalization.

[‡] See Appendix C for tests of significance.

[§] Standard errors shown in parentheses.

[**] No observations in this category.

[††] Standard errors not generated for these data.

other three groups of children in that those identified only by the audiometric test seem to have a higher incidence of parent-rated health and behavior problems. For example, well over one quarter of these children did not speak their first real word until after the age of one and a half; approximately 18% had poor health at age one; and about 18% were rated as being somewhat slower learners than other children their age. Because standard errors were not generated for these data, it was not possible to test the significance of these findings. For children identified only by the teacher, and for those not identified by any indicator set, there were no significant differences with respect to teacher rated classroom behaviors.

Achievement

Table 9 presents achievement and EFSIQ test scores for groups of children with possible hearing problems. When these scores are compared with the teacher's rating of intellectual ability in Table 8, there are interesting differences among the groups of children. For example, 41.6% of the children recommended only by teachers for special resources for hearing but who had no hearing loss according to the hearing exam, were rated as clearly below average in intellectual ability for their age. Yet, this group of children scored only slightly below the mean in both achievement tests and EFSIQ. On the other hand, for children identified by the audiometric test alone there is somewhat better agreement between test score results and teacher's ratings of intellectual ability. Teachers rated 20% of these children as below average and their test scores show their average performance to be slightly below the mean. While these differences were not found to be statistically significant, the group mean is more than one standard deviation below the mean for children not so identified.

Socioeconomic and Demographic Patterns

Finally, socioeconomic and demographic patterns were of interest to see if patterns were consistent with those found in Volume I. Table 10 presents the findings for various hearing indicators. It is important to note that because of differences in rates of identification across these variables, we are not concerned with absolute rates but instead with distributional patterns. In Volume I of this study,

Table 9[*]

MEAN SCORES ON ACHIEVEMENT TESTS AND MEAN EFSIQ SCORES OF CHILDREN IDENTIFIED AS POTENTIAL CANDIDATES FOR SERVICES FOR THE HEARING IMPAIRED AND CHILDREN NOT SO IDENTIFIED

	Group Mean WRAT Scores (Mean=50 on both)		Group Mean EFSIQ (Mean=100)	Number (in hundred thousands)
	Reading	Math		
Teacher Recommendation or Audiometric Test				
Not identified	50.4 (.31)[†]	50.3 (.46)	96.3 (.63)	224.2
Teacher recommendation but not audiometric test	48.2 (1.76)	49.1 (1.66)	93.5 (2.04)	2.3
Audiometric test but not teacher recommendation	37.4 (2.27)	37.8 (2.55)	79.7 (5.91)	.2
Teacher and audiometric test[‡]	38.0 (0.00)	23.0 (0.00)	73.0 (0.00)	.04
Teacher Recommendation or Parent Responses				
Not identified	50.5 (.31)	50.4 (.46)	96.4 (.61)	216.2
Teacher recommendation but not parent responses	46.2 (2.96)	47.4 (2.76)	91.8 (3.32)	1.1
Parent responses but not teacher recommendation	48.9 (1.66)	48.1 (.74)	93.2 (1.23)	8.2
Teacher recommendation and parent responses	49.6 (1.51)	49.7 (1.71)	94.3 (1.74)	1.3

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[*] See Appendix C for tests of significance.

[†] Standard errors in parentheses.

[‡] Sample too small to permit generalization.

Table 10[*]

SOCIOECONOMIC AND DEMOGRAPHIC CHARACTERISTICS OF CHILDREN IDENTIFIED AS POSSIBLE CANDIDATES FOR SPECIAL SERVICES FOR THE HEARING IMPAIRED

Characteristic	Number of Children in the U.S.[†]	Percent Identified by Various Indicator Sets (Standard Error)		
		Teacher Recommendation for Hearing Services[‡]	Parent Responses[‡]	Audiometry Test[‡]
Total	227	1.05% (.14)	4.18% (.38)	0.09% (.04)
Race				
Black	31	0.85 (.41)	5.04 (.87)	0.14[§] (.14)
White (includes "Other")	196	1.08 (.15)	4.04 (.35)	0.08 (.04)
Sex				
Male	115	1.11 (.18)	4.68 (.42)	0.14 (.06)
Female	111	0.99 (.19)	3.66 (.49)	0.04[§] (.04)
Family Income				
Less than $3,000	40	1.46 (.56)	6.45 (1.15)	0.37 (.18)
$3,000 to $4,999	40	0.60 (.25)	3.58 (.40)	--[**]
$5,000 to $6,999	51	1.44 (.37)	5.13 (.58)	0.10 (.08)
$7,000 to $9,999	47	1.25 (.41)	3.25 (.68)	--
$10,000 to $14,999	27	0.36 (.22)	1.99 (.46)	--
$15,000 and above	11	0.56 (.42)	3.52 (1.17)	--
Don't know/no response	11	0.69 (.49)	3.62 (.89)	--
Age				
6-7	76	1.36 (.29)	4.04 (.58)	--
8-9	77	0.88 (.19)	3.93 (.51)	0.10 (.07)
10-11	74	0.90 (.20)	4.59 (.47)	0.17 (.09)
Region				
Northeast	51	1.02 (.26)	3.14 (.55)	0.12 (.09)
Midwest	65	1.47 (.24)	4.39 (.73)	0.09[§] (.08)
South	54	0.85 (.27)	6.16 (.92)	0.08[§] (.08)
West	56	0.78 (.11)	2.97 (.35)	0.07[§] (.07)
Type of Place				
Rural	76	1.13 (.30)	4.45 (.64)	0.10 (.07)
Urban, under 50,000	34	0.78 (.36)	3.79 (.75)	0.11[§] (.11)
50,000-250,000 people	17	0.93 (.55)	5.77 (1.76)	0.12[§] (.13)
250,000-3 million	57	0.91 (.20)	3.63 (.84)	--
Over 3 million people	43	1.35 (.32)	4.13 (.82)	0.17 (.13)

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[*] See Appendix C for tests of significance.

[†] In hundred thousands.

[‡] Includes all children so identified, whether or not those children were also identified by another set of indicators.

[§] Sample too small to permit drawing valid conclusions.

[**] No observations in category.

examination of teacher-reported rates indicated a significantly higher proportion of physically handicapped children among lower income groups. This pattern is represented in Table 10. However, vision, hearing, and orthopedic handicaps were considered as a single group in Volume I. When hearing is considered separately the only significant differences in rates are those across family income and region. A higher percentage of children from the lowest-income families were identified from parent responses as having hearing problems than children from higher income groups. Responses of parents from the South indicated "trouble" hearing more frequently than responses of parents in the Northeast, Midwest, or West. A notable difference in patterns of identification by teacher and audiometric test occurs across age groups. While the teacher identifies more 6- and 7-year-olds, the test identifies more older children.

For children actually using resources there were no apparent differences in rates of participation based on socioeconomic or demographic status as shown in Table 11, with the exception that children from rural areas seemed to have fewer resources available than did children in other areas. However, since the group of children in each category is very small these findings should only be viewed as indicative rather than definitive.

Summary and Conclusions

With the aid of consultants, sets of indicators were developed from the NCHS data base and a series of comparisons were made. The medical examination findings were not used because of the small number of children identified.

The findings are:

- Parent responses identified a far greater number of children as having trouble hearing (4.2%) than did teachers or the audiometry test (1.0% and 0.1%, respectively).
- The extent of overlap between indicators varied widely. Only one out of four of the test-identified group were also recommended for special resources by the teacher. Thus three out of four were not recommended for resources. All of the test-identified children were also identified using parent response indicators.

Table 11*

SOCIOECONOMIC AND DEMOGRAPHIC STATUS, CHILDREN USING AND NOT USING SPECIAL RESOURCES FOR THE HEARING IMPAIRED WHO WERE RECOMMENDED FOR SUCH RESOURCES BY THE TEACHER

	Percent				Number (in thousands)			
	Total Group Recommended by Teacher†	Resources Used	Resources Available Not Used	Resources Not Available	Total Group Recommended by Teacher†	Resources Used	Resources Available Not Used	Resources Not Available
Total	1.1%	.4%	.2%	.5%	237.9	80.6	34.3	104.6
Sex								
Male	1.1	.4	.2	.3	128.0	51.1	24.1	39.8
Female	1.0	.3	.1	.6	109.9	29.5	10.2	64.7
Race								
Black	.9	.5	.1	.2	26.4	15.8	2.8	7.7
White	1.1	.3	.2	.5	211.5	64.8	31.5	96.8
Income								
Under $3,000	1.5	.5	.2	.7	59.0	20.0	7.5	28.6
$3,000-$4,999	.6	.3	.1	.1	24.2	12.7	3.9	2.8
$5,000-$6,999	1.4	.5	.2	.6	73.2	26.4	12.5	30.9
$7,000-$9,999	1.3	.3	.1	.8	58.1	11.8	3.5	38.2
$10,000-$14,999	.4	.1	.3	-	9.7	2.8	6.9	-
Over $15,000	.6	.3	-‡	-	5.9	3.3	-	-
Age								
6-7	1.4	.3	.3	.6	104.0	25.3	20.1	47.1
8-9	.9	.4	.1	.4	67.5	27.4	11.0	29.1
10-11	.9	.4	.0§	.4	66.5	27.8	3.2	28.4
Region								
Northeast	1.0	.3	.2	.4	52.2	17.9	10.1	18.7
Midwest	1.5	.6	.1	.7	96.1	41.0	8.3	43.8
South	.9	.2	.2	.3	45.9	12.4	11.6	14.3
West	.8	.2	.1	.5	43.7	9.2	4.4	27.8
Area Population								
Rural	1.1	.3	.1	.6	86.5	21.6	9.4	49.1
Urban, under 50,000	.8	.4	-	.3	26.5	15.1	-	11.4
50,000 to 250,000 people	.9	.4	.4	-	15.4	6.3	6.9	-
250,000 to 3 million people	.9	.4	.2	.3	52.2	22.4	11.1	14.4
Over 3 million people	1.4	.4	.2	.7	57.3	15.2	6.9	29.6

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*Standard errors not generated for these data.

†Total includes children for whom the availability of special resources was not known or may not add due to rounding.

‡No observations in this category.

§Less than 1/10 of 1%.

- Of the children recommended by the teacher for special resources and also using resources, approximately two out of three were also identified by a parent, but only 5% were identified by both audiometric test and teacher.
- Children identified only by the audiometric test appear to have a higher incidence of parent-rated health and behavioral problems than those recommended only by the teacher or those not recommended at all. The conditions noted are poor health at age 1, trouble hearing, earaches, and spoke the first real word after 1.5 years.
- Although there were no statistically significant differences in achievement test scores for groups of children identified by the teacher or audiometric test, children screened by the audiometry test had mean WRAT and EFSIQ scores more than one standard deviation below the children not so identified.
- Statistically significant differences were found across income and region of the country for children identified by parent risk factors. Children from low income families and children from the South were more likely to be identified by parents as having trouble hearing.

It should be pointed out that the educational and social development of a particular child with a hearing loss depends a great deal upon his or her individual adjustment to their handicap. The degree of adjustment is, in turn, related to such individual factors as "age of onset, degree of loss, general intelligence, emotional stability, effectiveness of treatment, and level of educational support in the home."[*]

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[*] Quigley, S. P., "Some Effects of Hearing Impairment Upon School Performance," (mimeographed manuscript prepared for the Division of Special Education Services, Office of the Superintendent of Public Instruction for the State of Illinois) Springfield, Illinois, 1970; Eagles, E. L., Hardy, W. G., Catlin, F. I., Human Communication: The Public Health Aspects of Hearing, Language and Speech Disorders, U.S. Government Printing Office, Washington D.C. (1968); Johnson, J. C., Educating Hearing Impaired Children in Ordinary School, Washington, D.C., Vola Bureau, 1962; and Committee on Child Health: Services for Children with Hearing Impairment, American Public Health Service, New York (1956).

Vision

Definitions

In order to compare findings of various assessments made on each child, we developed from the NCHS data and with the aid of consultants, the indicators shown in Table 12, to indicate that a child was a possible candidate for special resources for vision handicaps. No items from the medical history completed by the parent were deemed valid and reliable indicators of possible need for special resources for the visually handicapped.

Comparison of Overall Rates

Figure 5 shows the estimated rates of possible student need for special resources for vision. About 1.5% of the school population were classified as needing special resources for "sight-saving" by the teacher.* This rate fell between the rate of 0.5% obtained from the medical exam and 2.7% obtained for the severe criterion on the vision test. The relatively high rate resulting from the vision test is due to the fact that visual acuity was measured with the child not wearing corrective lenses. The need for special educational resources is generally based on corrected vision. We were unable to find other data on children's corrected vision to compare these reported rates. Data for adults, however, were available and visual acuity levels of adults were obtained from a study by Kessner and Kalk, 1973. While 2.4% of the adult population were found to have uncorrected distance acuity levels worse than 20/200 (considered legally blind), when they were tested wearing their corrective lenses the rate dropped to only 0.4%. Similarly, for near acuity, the percent of adults

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*There clearly is an ambiguity in the term "sight-saving" used in the NCHS survey school questionnaire and this may have led to confusion on the part of the teacher as to what was meant by "sight-saving" resources. In the Cycle III survey of 12-17 year-olds the terminology was changed to "visually handicapped."

Table 12

INDICATORS AND RISK FACTORS USED TO IDENTIFY CHILDREN AS POTENTIAL CANDIDATES FOR SERVICES FOR THE VISUALLY IMPAIRED

Teacher

In response to the item on the school questionnaire "If the following resources were available, check those you would recommend for this child," checked "Special provision for 'sight-saving.'"

Visual Test

Two criteria were established, based on the results of the NCHS visual acuity test:

- Moderate visual impairment, if the child's binocular distance acuity was 20/70 or worse or his/her binocular near acuity was 14/70 or worse, uncorrected.
- Severe visual impairment, if the child's binocular distance acuity was 20/200 or worse or his/her binocular near acuity was 14/140 or worse, uncorrected.

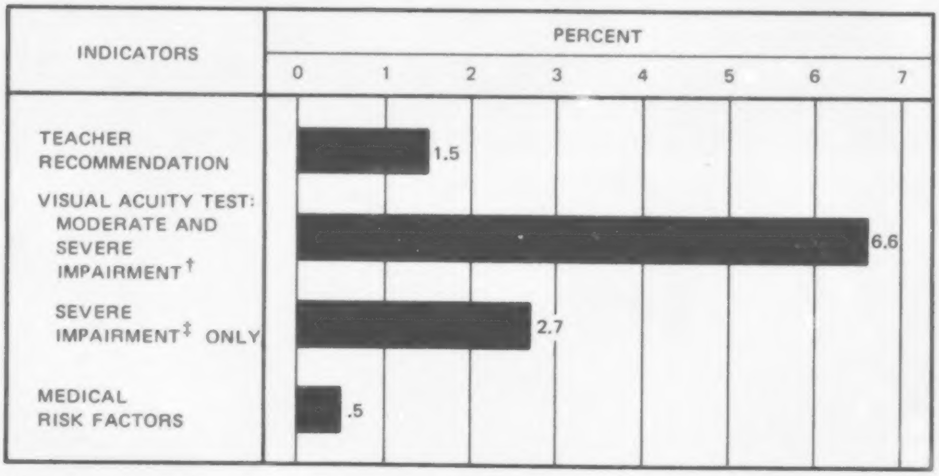
Parent Responses

None

Medical Findings

A number of items were used to establish a criterion for the medical examination. These included identification of the presence of

- An eye muscle imbalance
- Other eye condition
- The presence of manifest or latent strabismus.



*Estimated rates represent the population in school for whom school data were available. Estimated rates for children not in school are presented in Section VII.

†Uncorrected visual acuity of $< {}^{20}/_{70}$ or $< {}^{14}/_{70}$.

‡Uncorrected visual acuity of $\leq {}^{20}/_{200}$ or $\leq {}^{14}/_{140}$.

FIGURE 5 RATES OF THE POTENTIAL NEED FOR SPECIAL RESOURCES FOR THE VISUALLY HANDICAPPED USING VARIOUS INDICATORS*

with levels worse than 14/140 dropped from 4.3% uncorrected to 0.4% corrected (Kessner and Kalk, 1973, p. 76).

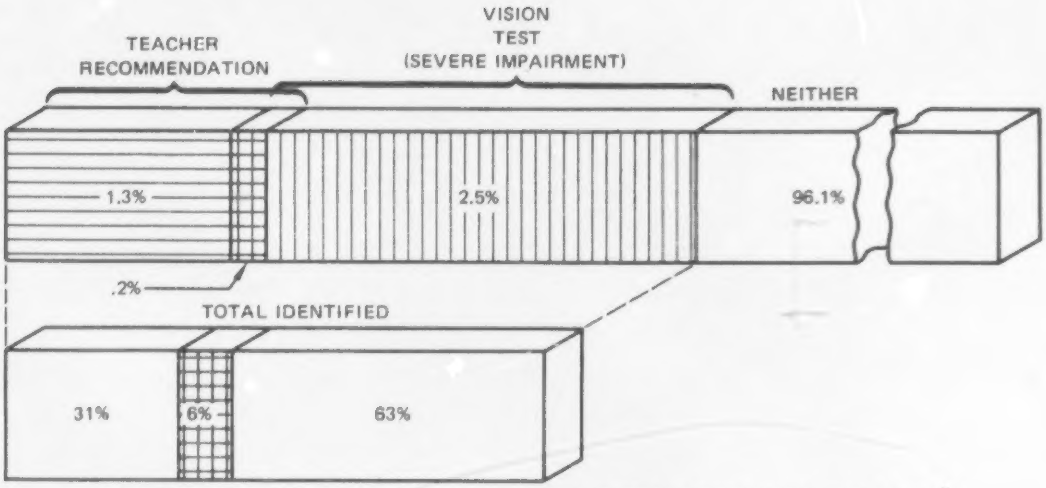
By considering only those children in the survey who did not wear glasses, 0.6% were identified by the severe visual test criterion and 0.9% were identified by the teacher. For the 10% of the children who did wear glasses, 22% were identified by the visual test criterion as having severe acuity problems and only 7% were identified by the teacher as needing special resources.

For the moderate test criterion, 6.6% of the children were identified by the test. Again, the overall rate is greatly inflated because corrective lenses were not worn for the test. For the adult data cited previously, the percent of adults with distance acuity worse than 20/100 dropped from 6.5% uncorrected to 0.8% corrected.

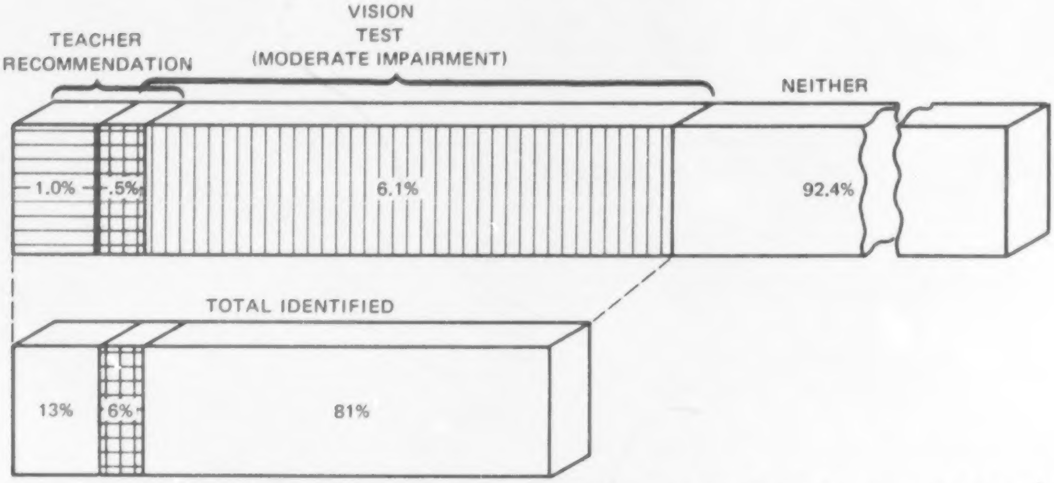
The indicator set used for the medical findings is related to muscle imbalance and strabismus (cross-eyed), neither of which affects actual visual acuity. Thus, it is not surprising that there is very little agreement between the cross-tabulation of those identified at the severe levels on the vision test and those identified on the medical exam. Therefore, the medical exam criterion does not appear very useful for the estimation of prevalence rates for the visually impaired and has not been used for further comparisons.

Extent of Agreement of Different Indicator Sets

Figure 6 shows the degree of agreement between teachers' recommendations for special resources and the vision test in identifying possible visual impairments. Of all the children with severe vision losses identified by the test, about 7% were identified by the teacher as candidates for special resources. Of all children recommended for special vision resources by teachers, only 17% were identified by the test. In all, only 0.2% of the entire school population were identified by both



(a) AGREEMENT BETWEEN TEACHER AND VISION TEST (SEVERE IMPAIRMENT LEVEL*)



(b) AGREEMENT BETWEEN TEACHER AND VISION TEST (MODERATE AND SEVERE IMPAIRMENT LEVEL†)

*Uncorrected visual acuity or $\leq {}^{20}/_{200}$ or $\leq {}^{14}/_{140}$.

†Uncorrected visual acuity or $\leq {}^{20}/_{70}$ or $\leq {}^{14}/_{70}$.

FIGURE 6 IDENTIFICATION OF CHILDREN WHO MAY NEED SERVICES FOR THE VISUALLY HANDICAPPED

the teacher and the test as candidates for special resources.* The percent of children identified by both the teacher and the test in the moderate range increased to 0.5% of the school population or about 33% of the teacher-identified population.

Availability and Use of Resources

Of the 1.4% of the total school population who were recommended by teachers for special resources for "sight-saving," 35% were using resources, 14% had resources available but were not using them, and 50% did not have resources available. Table 13 compares the availability and use of resources for "sight-saving" with rates of identification using the visual acuity test results and teacher recommendations. Of children using special resources 35% were identified as having moderate or severe acuity (uncorrected) and 15% were identified as having severe levels of visual impairment (uncorrected). For students for whom resources were recommended but not available 25% had vision impairments in the severe range (uncorrected). It is worth noting again that most students who were found to have moderate levels of vision impairment without corrective lenses probably would have no visual difficulties if glasses were used.

The percent distribution of children identified as needing special resources by the teacher across levels of distance acuity are presented in Figure 7. More than 40% of the children recommended by teachers for special resources had a tested distance acuity of 20/20 or better. It is not clear why teachers might recommend special resources for a child with apparently normal visual acuity. In the 1960s, when the NCHS sample

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*This rate corresponds to that estimated by the National Society for the Prevention of Blindness who concluded that prevalence rates for partially seeing school children (visual acuity better than 20/200, but worse than 20/70 in the better eye after correction) is approximately 0.2%. National Society for the Prevention of Blindness, Inc., "Estimated Statistics on Blindness and Vision Problems," New York, 1966 (1968, Supplement included).

Table 13

APPLICATION OF INDICATORS TO POPULATION FOR WHOM TEACHER HAD RECOMMENDED SPECIAL "SIGHT SAVING" RESOURCES

Source of Identification	Percent of Total Teacher-Identified Group	Percent of Group Using Special Resources	Percent of Group Not Using Special Resources (Resources Available)	Percent of Group Without Resources Available
Vision Test (Moderate and Severe Level)*				
Identified	32%	35%	38%	34%
Not Identified	68	65	62	66
Total	100%	100%	100%	100%
Vision Test (Severe Level Only)†				
Identified	16	15	7	25
Not Identified	84	85	93	75
Total	100%	100%	100%	100%

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[*] Uncorrected visual acuity of ≤20/70 or ≤14/70.

[†] Uncorrected visual acuity of ≤20/200 or ≤14/140.

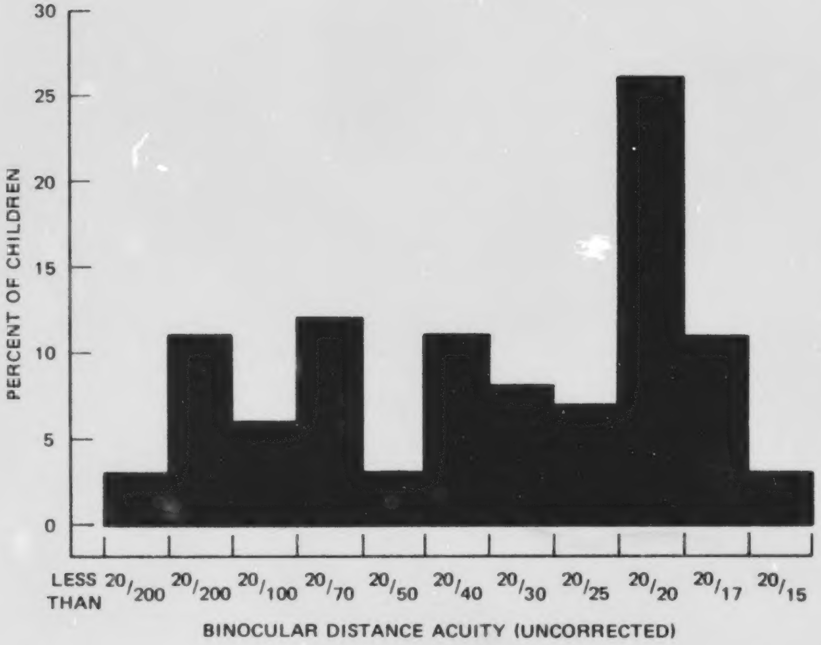

FIGURE 7 PERCENT DISTRIBUTION OF CHILDREN RECOMMENDED BY TEACHERS FOR SIGHT SAVING RESOURCES ACROSS BINOCULAR DISTANCE ACUITY (UNCORRECTED)

was studied, many teachers were not aware of the distinction between dyslexia (the inability to read because of defects in processing visual symbols) and visual impairments. Therefore, some children who may have had problems reading or writing might have been incorrectly identified as visually handicapped (see Exhibit 2). The term "sight-saving," used in the NCHS survey, may have confused many teachers.

Home and School Behaviors and Health Histories

In terms of health histories and current school behaviors, most children identified as having moderate or severe visual acuity on the vision test appear little different from children who were not identified (Table 14). The only differences appear to be that parents reported more than half of these children as having had an incidence of eye trouble and having experienced crossed eyes at some period. For children identified only by the teacher as candidates for special "sight saving" resources, significantly higher numbers were reported by parents to have had poor health at one year of age, were reported to be slower in learning than other children their age, and were reported to have had more trouble with their eyes. In addition, one out of four of the teacher-identified group was rated by the teacher as clearly below average in intellectual ability.

Achievement

Teachers' ratings of intellectual ability, shown in Table 14, when coupled with the achievement of EFSIQ scores shown in Table 15, suggest that performance rather than visual impairment may have been the reason for recommendations for special resources by teachers. All groups of children except those that were identified only by teacher recommendation were achieving at or above the mean on both achievement and EFSIQ while children identified only by the teacher scored, on the average, somewhat below the mean. This suggests that teachers may have attributed poor performance to visual problems reflecting the need for a clearer distinction between vision impairment (which in many cases can be greatly alleviated by corrective lenses) and more serious problems in the mental processing of visual information which is unrelated to visual acuity. (see Exhibit 2).

Exhibit 2

VISION DISORDERS AND DYSLEXIA

A report by the National Academy of Science's Institute of Medicine, "Strategy for Evaluating Health Services," notes that there has been great confusion over the possible effect of peripheral eye disorders in reading and learning disorders. While some studies have emphasized the importance of eye disorders in learning problems, others have suggested that peripheral disorders may contribute to, but are not critical in, learning disabilities of children.

In a 1972 statement on the relationship between eye disorders and learning disabilities issued jointly by the American Academy of Pediatrics, the American Academy of Ophthalmology and Otolaryngology, and the American Association of Ophthalmology (with the assistance of individuals from the Division for Children with Learning Disabilities), the following points were made:

(1) Learning disability and dyslexia, as well as other forms of school underachievement, require a multidisciplinary approach from medicine, education, and psychology in diagnosis and treatment. Eye care should never be instituted in isolation when a patient has a reading problem. Children with learning disabilities have the same incidence of ocular abnormalities, e.g., refractive errors and muscle imbalance, as children who are normal achievers and reading at grade level. These abnormalities should be corrected.

(2) Since clues in word recognition are transmitted through the eyes to the brain, it has become common practice to attribute reading difficulties to subtle ocular abnormalities presumed to cause faulty visual perception. Studies have shown that there is no peripheral eye defect that produces dyslexia and associated learning disabilities. Eye defects do not cause reversals of letters, words, or numbers.

(3) No known scientific evidence supports claims for improving the academic abilities of learning-disabled or dyslexic children with treatment based solely on:

   (a) Visual training (muscle exercises, ocular pursuit, glasses).

   (b) Neurologic organizational training (laterality training, balance board, perceptual training).

(4) Excluding correctable ocular defects, glasses have no value in the specific treatment of dyslexia or other learning problems. In fact, unnecessarily prescribed glasses may create a false sense of security that may delay needed treatment.

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Exhibit 2 (Continued)

(5) The teaching of learning-disabled and dyslexic children is a problem of educational science. No one approach is applicable to all children. A change in any variable may result in increased motivation of the child and reduced frustration. Parents should be made aware that mental level and psychological implications are contributing factors to a child's success or failure. Ophthalmologists and other medical specialists should offer their knowledge. This may consist of the identification of specific defects, or simply early recognition.

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Table 14

SCHOOL BEHAVIOR AND DEVELOPMENTAL PROFILES OF CHILDREN RECOMMENDED BY TEACHERS TO RECEIVE "SIGHT SAVING" RESOURCES, CHILDREN IDENTIFIED BY THE VISION TEST, CHILDREN IDENTIFIED BY BOTH TEACHERS AND THE VISION TEST, AND CHILDREN IDENTIFIED BY NEITHER

	Neither Teacher nor Vision Test	Teacher Only	Vision Test Only[*]	Both Teacher and Vision Test[*]
Number (in hundred thousands)	217.8	2.7	5.7	.5
Mean EFSIQ (Standard Error)	96.2 (.63)	92.4 (1.42)	101.4 (1.34)	96.8 (3.74)
School Profiles[†] (Teacher Ratings, %)				
Less attentive than most for his/her age	22.7 (.84)[‡]	20.9 (5.47)	16.9 (3.73)	6.1 (5.59)
Extremely restless for his/her age (constantly moving)	8.5 (.43)	9.1 (3.11)	5.9 (2.12)	--[§]
Intellectual ability is clearly below average for age	19.0 (.69)	25.4 (5.14)	14.1 (3.52)	17.7 (9.74)
Health/Developmental Variables[**] (Parent Ratings, %)				
Birth injury noted	.3	--	--	--
Poor health at age 1	1.6	3.0	1.1	--

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[*] Uncorrected visual acuity ≤20/200 or ≤14/140, severe level of impairment.

[†] See Appendix C for tests of significance.

[‡] Standard errors shown in parentheses.

[§] No observations in this category.

[**] Standard errors not generated for these data.

Table 14 (Continued)

SCHOOL BEHAVIOR AND DEVELOPMENTAL PROFILES OF CHILDREN RECOMMENDED BY TEACHERS TO RECEIVE "SIGHT SAVING" RESOURCES, CHILDREN IDENTIFIED BY THE VISION TEST, CHILDREN IDENTIFIED BY BOTH TEACHERS AND THE VISION TEST, AND CHILDREN IDENTIFIED BY NEITHER

	Neither Teacher nor Vision Test	Teacher Only	Vision Test Only[*]	Both Teacher and Vision Test[*]
Health/Developmental Variables[**] (Parent Ratings, %) (Continued)				
Learning speed is slower than for other his/her age	3.9	5.1	3.2	--[§]
Spoke first real word after 1.5 years old	9.1	9.9	7.4	--
Has other eye trouble	10.8	40.6	55.3	79.9
Has crossed eyes	2.2	18.5	5.2	16.3
Has had operation on eyes	1.1	14.3	1.5	5.5
A foreign language is spoken in the home	11.3	3.8	7.6	--

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[*] Uncorrected visual acuity ≤20/200 or ≤14/140, severe level of impairment.

[†] See Appendix C for tests of significance.

[‡] Standard errors shown in parentheses.

[§] No observations in this category.

[**] Standard errors not generated for these data.

Table 15[*]

MEAN SCORES ON ACHIEVEMENT TESTS AND MEAN EFSIQ SCORES OF CHILDREN IDENTIFIED AS POTENTIAL CANDIDATES FOR "SIGHT SAVING" RESOURCES AND CHILDREN NOT SO IDENTIFIED

	WRAT Scores (Mean=50 on both)		Group Mean EFSIQ (Mean=100)	Number (in hundred thousands)
	Reading	Math		
Teacher Recommendation or Vision Test[‡]				
Not identified	50.4 (.32)[†]	50.3 (.46)	96.2 (.63)	217.8
Teacher recommendation but not the vision test	47.8 (1.35)	47.2 (1.22)	92.4 (1.42)	2.8
Vision test but not teacher recommendation	53.3 (.62)	52.6 (.81)	101.4 (1.34)	5.7
Teacher recommendation and vision test	50.8 (2.66)	51.0 (2.59)	96.8 (3.74)	.5

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[*] See Appendix C for tests of significance.

[†] Standard errors in parentheses.

[‡] Uncorrected visual acuity ≤20/200 or 14/140, severe level of impairment.

Therefore, if only the estimated rates suggested by the overlap between teachers' recommendations and the vision test criteria are used, the probable rates of visual impairment of children in the NCHS survey are quite low, and do not appear to have a serious negative effect on school performance provided there is early identification of need and adequate and early correction is assured.

Comparison of Socioeconomic and Demographic Patterns

Comparisons of children identified by various means as possible candidates for special resources for the visually handicapped are presented across selected demographic and socioeconomic variables in Table 16. The most striking pattern found is the noticeable increase of rates of identification with increasing age. It is well documented that visual acuity tends to become worse with age and the findings reported here are consistent with trends found by other researchers.* On other characteristics, however, the patterns are not consistent. For example, identification based on the teacher recommendation tends to decrease as income increases while rates based on the vision test tend to increase with increasing income. Similarly, the South shows the highest rate based on teacher identification and the lowest rate based on the visual acuity test results. Kessner and Kalk (1973) found that the prevalence of severe visual impairments and blindness is greater in the South than in other regions.

In looking at socioeconomic and demographic factors across the availability and use of resources (Table 17) there are no apparent patterns that would indicate differential use of resources based on these variables. There is a slight indication that fewer resources may be available to children from low-income families and children living outside of urban areas.

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*See David M. Kessner and Carolyn E. Kalk, A Strategy for Evaluating Health Services, Vol. 2, Institute of Medicine, Washington, 1973, pp. 71-76, which also reports similar change in rates across age for children 5 through 15 years.

Table 16[*]

SOCIOECONOMIC AND DEMOGRAPHIC CHARACTERISTICS OF CHILDREN IDENTIFIED AS POSSIBLE CANDIDATES FOR "SIGHT SAVING" RESOURCES

Characteristics	Number of Children in the U.S.[†]	Percent Identified by Various Indicator Sets (Standard Error)		
		Teacher Recommendacion for "Sight-Saving Resources"[‡]	Visual Acuity Test[‡]	
			Moderate and Severe Impairment[§]	Severe Impairment[**]
Total	227	1.45% (.14)	6.60% (.34)	2.74% (.28)
Race				
Black	31	1.89 (.64)	6.16 (.55)	1.74 (.47)
White (includes "Other")	196	1.39 (.14)	5.83 (.41)	2.90 (.30)
Sex				
Male	115	1.51 (.19)	5.87 (.55)	2.39 (.35)
Female	111	1.39 (.20)	7.35 (.60)	3.09 (.39)
Family Income				
Less than $3,000	40	2.24 (.60)	4.97 (.57)	2.00 (.34)
$3,000 to $4,999	40	1.49 (.41)	5.00 (.68)	2.39 (.60)
$5,000 to $5,999	51	1.11 (.30)	7.40 (.71)	2.90 (.49)
$7,000 to $9,999	47	1.27 (.30)	7.32 (.71)	2.83 (.52)
$10,000 to $14,999	27	1.18 (.39)	8.77 (.93)	3.61 (.59)
$15,000 and above	11	0.38 (.27)	7.24 (1.69)	3.61 (1.18)
Don't know/no response	11	2.49 (.66)	5.73 (1.56)	2.61 (1.27)
Age				
6-7	76	1.04 (.19)	3.70 (.34)	1.00 (.23)
8-9	77	1.35 (.22)	5.64 (.54)	2.49 (.35)
10-11	74	1.99 (.27)	10.59 (.96)	4.79 (.64)
Region				
Northeast	51	1.66 (.24)	7.61 (.84)	3.22 (.67)
Midwest	65	1.11 (.40)	7.72 (.83)	3.01 (.43)
South	54	2.16 (.30)	4.56 (.45)	1.60 (.28)
West	56	0.95 (.19)	6.31 (1.17)	3.08 (.82)
Type of Place				
Rural	76	1.39 (.24)	5.80 (.62)	2.40 (.41)
Urban, under 50,000	34	1.65 (.45)	7.10 (.91)	1.94 (.50)
50,000-250,000 people	17	1.71 (.34)	6.13 (2.10)	2.43 (.73)
250,000-3 million people	57	1.15 (.32)	7.19 (.98)	3.46 (.70)
Over 3 million people	43	1.68 (.33)	7.01 (.30)	3.13 (.39)

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[*] See Appendix C for tests of significance.

[†] In hundred thousands.

[‡] Includes all children so identified, whether or not those children were also identified by another set of indicators.

[§] Uncorrected visual acuity ≤20/70 or ≤14/70 moderate and severe level of impairment.

[**] Uncorrected visual acuity ≤20/200 or ≤14/140 severe level of impairment.

Table 17[*]

SOCIOECONOMIC AND DEMOGRAPHIC STATUS, CHILDREN USING AND NOT USING "SIGHT SAVING" RESOURCES WHO WERE RECOMMENDED FOR SUCH RESOURCES BY THE TEACHER

	Percent				Number (in thousands)			
	Total Group Recommended by Teacher[†]	Resources Used	Resources Available Not Used	Resources Not Available	Total Group Recommended by Teacher[†]	Resources Used	Resources Available Not Used	Resources Not Available
Total	1.4%	.5%	.2%	.4%	329.7	116.1	47.2	89.6
Sex								
Male	1.5	.6	.2	.3	174.6	66.0	26.3	35.6
Female	1.4	.4	.2	.5	155.1	50.1	21.0	54.0
Race								
Black	1.9	.5	.3	.7	58.6	15.1	10.8	21.7
White	1.4	.5	.2	.3	271.1	101.0	36.4	67.9
Income								
Under $3,000	2.2	.5	.3	.7	90.5	21.6	11.3	29.5
$3,000-$4,999	1.5	.6	.2	.3	59.8	25.3	8.1	11.1
$5,000-$6,999	1.1	.5	.1	.3	56.3	23.4	5.2	13.1
$7,000-$9,999	1.3	.4	.3	.4	59.1	19.1	12.9	19.0
$10,000-$14,999	1.2	.5	.1	.2	32.0	14.2	3.1	4.3
Over $15,000	.4	.2	-[‡]	.2	4.1	2.0	-	2.1
Age								
6-7	1.0	.4	.2	.1	79.4	30.7	15.9	10.3
8-9	1.4	.4	.2	.6	103.8	28.7	15.1	42.5
10-11	2.0	.8	.2	.5	146.5	56.7	16.2	36.9
Region								
Northeast	1.7	.8	.2	.5	86.5	43.3	10.1	24.3
Midwest	1.1	.3	.3	.3	72.5	21.2	16.5	20.8
South	2.2	.6	.3	.7	117.2	34.7	14.4	38.6
West	1.0	.3	.1	.1	53.5	16.9	6.1	5.9
Area Population								
Rural	1.4	.4	.1	.5	106.4	29.9	6.4	37.4
Urban, under 50,000	1.7	.8	.3	.3	57.0	25.5	10.7	8.8
50,000 to 250,000 people	1.7	.6	.5	.5	28.5	9.3	7.8	8.1
250,000 to 3 million people	1.2	.4	.1	.3	66.1	23.9	6.1	19.6
Over 3 million people	1.7	.6	.4	.4	71.6	27.6	16.2	15.7

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[*] Standard errors not generated for these data.

[†] Total includes children for whom the availability of special resources was not known or may not add due to rounding.

[‡] No observations in this category.

Summary and Conclusions

To examine the possible need for special resources for the visually handicapped, indicators were developed from the NCHS data using teacher recommendations and findings from the visual acuity test given to all children in the sample. Parent responses did not include any items that were considered valid and reliable indicators of possible need for special services. Similarly, medical examination findings were discarded as they concerned only eye muscle imbalance and strabismus (crossed eye), neither of which affects actual visual acuity. Home and school behaviors as well as health variables and achievement and EFSIQ scores were also examined. Finally, socioeconomic and demographic patterns were compared. The findings are as follows:

- More than 40% of the children recommended by teachers for special resources for "sight saving" (services for visually impaired) had a tested distance acuity of 20/20 or better.
- Half of the children using special resources for sight-saving had normal vision as measured by the visual acuity test.
- Children who tested at the moderate to severe levels of acuity (uncorrected) did not have health histories or school behaviors much different from children not identified by either the test or teacher.
- Children identified only by the teacher were reported to have had a significantly greater incidence of poor health at one year of age, and trouble with their eyes, and were reported by their parents as being slower to learn than other children.
- Children identified by the test (or by both test and teacher) appeared to be achieving at or above the mean of children not so identified, in terms of WRAT math and reading scores and EFSIQ test scores.
- Children identified only by teacher recommendation scored, on the average, somewhat below the mean on WRAT math and reading, and EFSIQ scores.
- The most significant patterns across socioeconomic and demographic variables is an increase of identification rates based on vision tests with increasing age.

Orthopedic

Definitions

In order to compare findings of various assessments made on each child, indicators were developed from the NCHS data, with the help of consultants, to identify possible candidates for special resources for the orthopedically handicapped.

The term "orthopedically handicapped" is very broad and could include children who have some orthopedic handicap but do not require any special educational facility. Particularly in the case of the parent-response indicator sets, all except the presence of cerebral palsy are unlikely to be direct indicators of special need for educational resources. Nevertheless, it was deemed of interest to compare the groups of children identified by these indicators in terms of their school and home behaviors as well as health variables and test scores.

The indicators selected are shown in Table 18.

Figure 8 shows the percentage of children in school, with school data, who were identified by the various types of indicators.

Comparison of Overall Rates

The overall rates of identification of children in the NCHS sample who may be orthopedically handicapped differ greatly by source, as shown in Figure 8. Teacher recommendations for special resources produced the smallest rate (0.4%) while parent responses produced the largest rate (3.0%). The rate for parent responses is probably greatly inflated because children were included who may have had temporary problems such as broken limbs or aches and pains, as well as children with special problems. Children so identified do not necessarily require special education services. A study of British children indicates that the prevalence of orthopedic handicaps in Great Britain is approximately 0.6%,* which is comparable to the teachers' estimate of need in this study.

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*National Children's Bureau, National Child Development Study.

Table 18

INDICATORS AND RISK FACTORS USED TO IDENTIFY CHILDREN AS POSSIBLE CANDIDATES FOR SERVICES FOR THE ORTHOPEDICALLY HANDICAPPED

Teacher

In response to the question "If the following special resources were available, check those you would recommend for this child," checked "Special provision for orthopedically handicapped."

Parent Responses

A yes answer to any one of the following:

"Does this child have a limp or any trouble when he/she walks?"

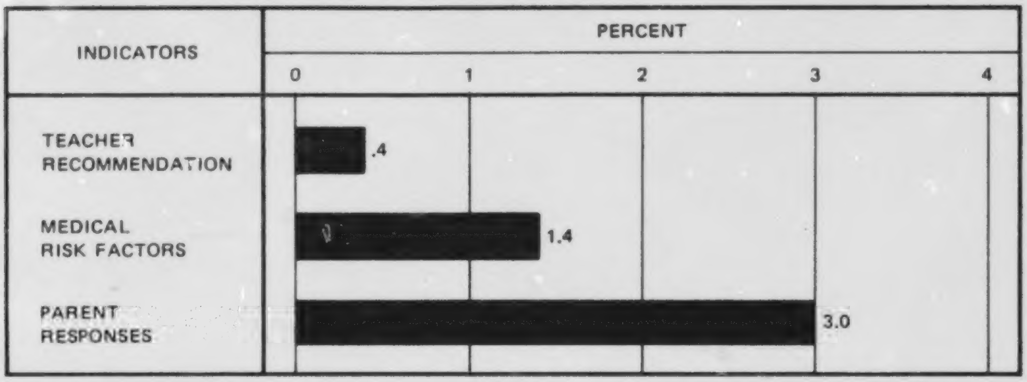
"Does he/she have any paralysis or any weakness or trouble in using either arm or leg?"

"Has this child ever had cerebral palsy?"

Medical Findings

An indication by the examining pediatrician of any one of the following conditions:

- Cerebral palsy or brain damage
- Other neurological condition
- Musculo-skeletal-joint condition
- Other musculo-skeletal-joint condition, undifferentiated.



*Estimated rates represent the population in school for whom school data were available. Estimated rates for children not in school are presented in Section VII.

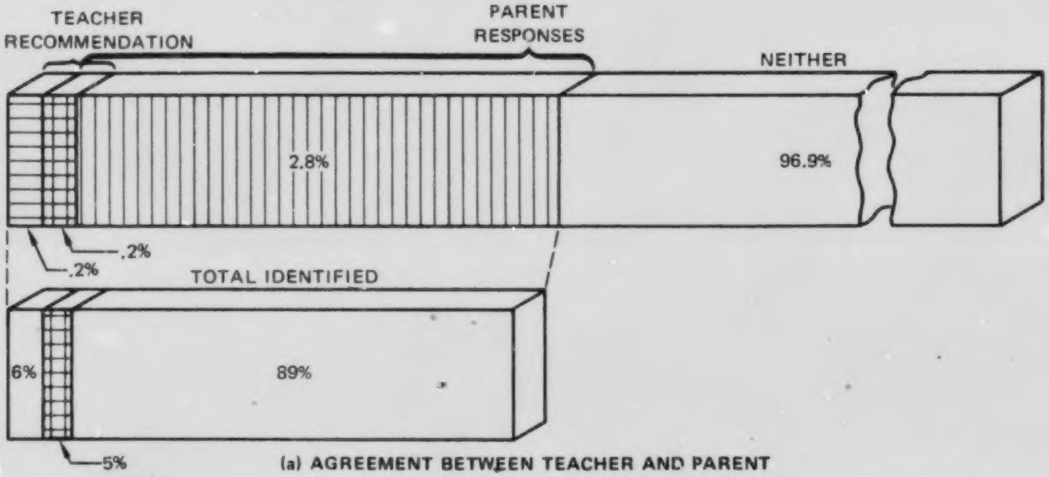
FIGURE 8 RATES OF THE POTENTIAL NEED FOR SPECIAL RESOURCES FOR THE ORTHOPEDICALLY HANDICAPPED USING VARIOUS INDICATORS*

Extent of Agreement Among Various Indicators

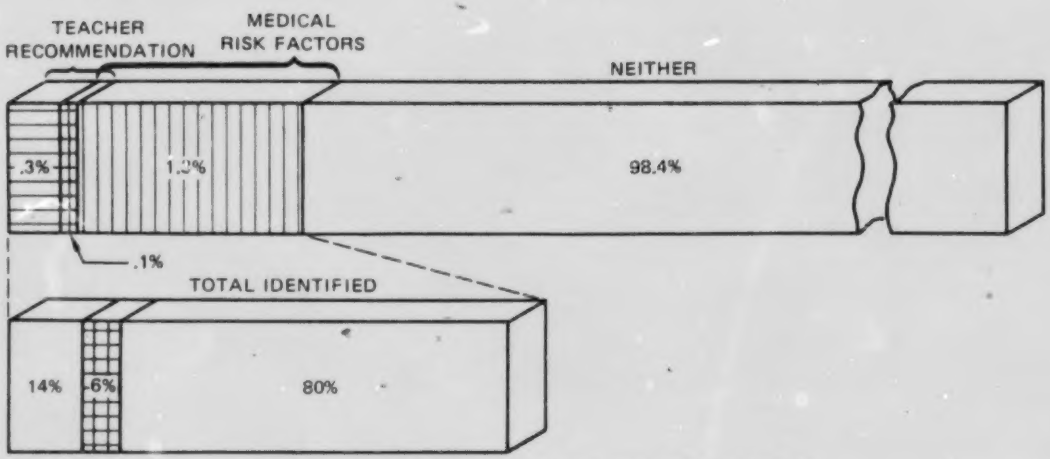
Given the small number of children recommended by teachers to receive special services for the orthopedically handicapped, it was of interest to explore the extent to which there was any agreement between teacher recommendations, parent responses, and medical findings. As shown in Figure 9, approximately half of the group identified by the teacher as needing special resources for the orthopedically handicapped were also identified by parent responses (arm or leg weakness or paralysis, cerebral palsy, or trouble walking). However, only one out of four of those identified by teacher recommendation was also identified by the pediatrician as having neurological damage, cerebral palsy, or musculo-skeletal-joint conditions.

Availability and Use of Resources

Of the 0.3% of all children sampled who were identified as possible candidates for special resources for the orthopedically handicapped, 44% were using such resources, 23% had resources available but were not using them, and 33% did not have resources available. Table 19 shows that for children using resources, 54% were identified by medical factors as possible candidates for services. For those recommended but



(a) AGREEMENT BETWEEN TEACHER AND PARENT



(b) AGREEMENT BETWEEN TEACHER AND PEDIATRICIAN

FIGURE 9 IDENTIFICATION OF CHILDREN WHO MAY NEED SERVICES FOR THE ORTHOPEDICALLY HANDICAPPED

Table 19

APPLICATION OF INDICATORS TO POPULATION FOR WHOM TEACHER HAD RECOMMENDED SPECIAL RESOURCES FOR THE ORTHOPEDICALLY HANDICAPPED

Source of Identification	Percent of Total Teacher-Identified Group	Percent of Group Using Special Resources	Percent of Group Not Using Special Resources (Resources Available)	Percent of Group Without Resources Available
Medical Risk Factors:				
Identified	32%	54%	--*	24%
Not Identified	68	46	100	76
Total	100%	100%	100%	100%
Parent Indicators:				
Identified	47	58	11	71
Not Identified	53	42	89	29
Total	100%	100%	100%	100%

---

*No observations in category.

for whom services were not available, almost one quarter (24%) we also identified by medical factors. Slightly more children receiving services were also identified by parent indicators (58%).

Health/Developmental and Behavioral Profiles

The health and developmental profiles were examined for two groupings: children identified by teacher recommendation, parent response, both, and neither; and children identified by teacher recommendation, medical findings, both, and neither (Table 20). Percentages of children with low birth weight and congenital malformations are highest in the doubly identified group in each of the two groupings. However, for those children identified by both parent responses and teacher recommendations it appears that for nearly one out of four (23.7%), the parent reported complications of pregnancy and labor, at a much higher percentage than that for children identified by both teacher and medical findings. Children identified only by the teacher differ from children identified only by medical findings on the variables "Child has been knocked unconscious" and "Child has had other injury or accident that troubled him/her quite a bit." Children identified only by the teacher had percentages for these variables that were twice as high as children identified only from medical findings.

In terms of school behavior variables (Table 21), children doubly identified (teacher and parent responses or teacher and medical findings) formed a distinctive group. More than half of them were rated as less attentive than most for his/her age, and about seven out of ten were rated as clearly below average in intellectual ability for his/her age. Those identified by teachers but not confirmed by medical findings differed from those identified by medical findings alone primarily in the rate at which teachers considered them to be extremely restless for his/her age (17.7% for those identified by teachers only in contrast to 8.7% for those identified by medical findings only) and in the rate at which the children were considered to be intellectually below average (37% for those identified only by teachers and 21% for those identified only from medical findings).

Table 20*

DEVELOPMENTAL PROFILES OF CHILDREN IDENTIFIED AS POSSIBLE CANDIDATES FOR SERVICES FOR THE ORTHOPEDICALLY HANDICAPPED AND CHILDREN NOT SO IDENTIFIED

	Neither Teacher nor Parent Responses	Teacher Only	Parent Responses Only	Both Teacher and Parent Responses
A. Children Identified by Teacher Recommendation or Parent Responses				
Number (in hundred thousands)	219.7	0.4	6.3	0.4
Mean EFSIQ	96.3	97.9	94.6	88.7
(Standard Error)	(.62)	(5.55)	(1.66)	(6.19)
Health/Developmental Variables (Parent Ratings, %)				
Complications of pregnancy and labor	8.5%	--†	12.5%	23.7%
Birth injury noted	0.3	--	1.8	--
Congenital malformation	0.9	--	0.9	23.6
Weight under 5 lbs. at birth	2.8	--	4.0	27.0
Poor health at age 1 year	1.5	--	5.0	6.1
Child has been knocked unconscious	3.3	9.0	6.6	7.4
Child has had other accident or injury that troubled him/her quite a bit	4.0	9.9	12.5	10.0
Child is physically restricted from hard exercise or play because of health	21.5	--	48.3	68.6
A foreign language is spoken in the home	10.4	--	11.8	7.8

---

*Standard errors not generated for these data.

†No observations in this category.

for whom services were not available, almost one quarter (24%) we also identified by medical factors. Slightly more children receiving services were also identified by parent indicators (58%).

Health/Developmental and Behavioral Profiles

The health and developmental profiles were examined for two groupings: children identified by teacher recommendation, parent response, both, and neither; and children identified by teacher recommendation, medical findings, both, and neither (Table 20). Percentages of children with low birth weight and congenital malformations are highest in the doubly identified group in each of the two groupings. However, for those children identified by both parent responses and teacher recommendations it appears that for nearly one out of four (23.7%), the parent reported complications of pregnancy and labor, at a much higher percentage than that for children identified by both teacher and medical findings. Children identified only by the teacher differ from children identified only by medical findings on the variables "Child has been knocked unconscious" and "Child has had other injury or accident that troubled him/her quite a bit." Children identified only by the teacher had percentages for these variables that were twice as high as children identified only from medical findings.

In terms of school behavior variables (Table 21), children doubly identified (teacher and parent responses or teacher and medical findings) formed a distinctive group. More than half of them were rated as less attentive than most for his/her age, and about seven out of ten were rated as clearly below average in intellectual ability for his/her age. Those identified by teachers but not confirmed by medical findings differed from those identified by medical findings alone primarily in the rate at which teachers considered them to be extremely restless for his/her age (17.7% for those identified by teachers only in contrast to 8.7% for those identified by medical findings only) and in the rate at which the children were considered to be intellectually below average (37% for those identified only by teachers and 21% for those identified only from medical findings).

Table 20[*]

DEVELOPMENTAL PROFILES OF CHILDREN IDENTIFIED AS POSSIBLE CANDIDATES FOR SERVICES FOR THE ORTHOPEDICALLY HANDICAPPED AND CHILDREN NOT SO IDENTIFIED

	Neither Teacher nor Parent Responses	Teacher Only	Parent Responses Only	Both Teacher and Parent Responses
A. Children Identified by Teacher Recommendation or Parent Responses				
Number (in hundred thousands)	219.7	0.4	6.3	0.4
Mean EFSIQ (Standard Error)	96.3 (.62)	97.9 (5.55)	94.6 (1.66)	88.7 (6.19)
Health/Developmental Variables (Parent Ratings, %)				
Complications of pregnancy and labor	8.5%	--[†]	12.5%	23.7%
Birth injury noted	0.3	--	1.8	--
Congenital malformation	0.9	--	0.9	23.6
Weight under 5 lbs. at birth	2.8	--	4.0	27.0
Poor health at age 1 year	1.5	--	5.0	6.1
Child has been knocked unconscious	3.3	9.0	6.6	7.4
Child has had other accident or injury that troubled him/her quite a bit	4.0	9.9	12.5	10.0
Child is physically restricted from hard exercise or play because of health	21.5	--	48.3	68.6
A foreign language is spoken in the home	10.4	--	11.8	7.8

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[*] Standard errors not generated for these data.

[†] No observations in this category.

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Table 20* (Continued)

DEVELOPMENTAL PROFILES OF CHILDREN IDENTIFIED AS POSSIBLE CANDIDATES FOR SERVICES FOR THE ORTHOPEDICALLY HANDICAPPED AND CHILDREN NOT SO IDENTIFIED

	Neither Teacher nor Medical Risk Factors	Teacher Only	Medical Risk Factors Only	Both Teacher and Medical Risk Factors
B. Children Identified by Teacher Recommendations or Medical Risk Factors				
Number (in hundred thousands)	223.1	0.5	2.9	0.2
Mean EFSIQ (Standard Error)	96.3 (.62)	95.7 (3.03)	95.7 (1.85)	89.0 (7.57)
Health/Developmental Variables (Parent Ratings, %)				
Complications of pregnancy and labor	8.6%	17.0%	13.3%	--†
Birth injury noted	0.4	--	--	--
Congenital malformation	0.8	5.4	2.6	27.2
Weight under 5 lbs. at birth	2.8	6.9	4.8	25.2
Poor health at age 1 year	1.6	4.2	2.0	--
Child has been knocked unconscious	3.4	11.7	5.4	--
Child has had other injury or accident that troubled him/her quite a bit	4.2	14.9	5.6	--
Child is physically restricted from hard exercise or play because of health	23.9	35.6	51.0	76.5
A foreign language is spoken in the home	10.5	--	7.0	11.6

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*Standard errors not generated for these data.

†No observations in this category.

Table 21[*]

SCHOOL BEHAVIOR PROFILES OF CHILDREN IDENTIFIED AS POSSIBLE CANDIDATES FOR SPECIAL SERVICES FOR THE ORTHOPEDICALLY HANDICAPPED AND CHILDREN NOT SO IDENTIFIED

	Neither Teacher nor Parent Responses	Teacher Only	Parent Responses Only	Both Teacher and Parent Responses
A. Children Identified by Teacher Recommendation or Parent Responses				
Number (in hundred thousands)	219.7	0.4	6.3	0.4
Mean EFSIQ (Standard Error)	96.3 (.62)	97.9 (5.55)	94.6 (1.66)	88.7 (6.19)
School Profile (Parent Ratings, %)				
Less attentive than most for his/her age	22.29% (.79)[†]	21.65% (18.36)	28.29% (3.47)	50.38% (22.22)
Extremely restless for his/her age (constantly moving)	8.33 (.43)	13.94 (12.63)	11.48 (2.02)	20.79 (14.63)
Intellectual ability is clearly below average for his/her age	18.57 (.63)	29.95 (15.89)	29.12 (4.58)	69.70 (20.56)

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[*] See Appendix C for tests of significance.

[†] Standard errors shown in parentheses.

Table 21[*] (Continued)

SCHOOL BEHAVIOR PROFILES OF CHILDREN IDENTIFIED AS POSSIBLE CANDIDATES FOR SPECIAL SERVICES FOR THE ORTHOPEDICALLY HANDICAPPED AND CHILDREN NOT SO IDENTIFIED

	Neither Teacher nor Medical Risk Factors	Teacher Only	Medical Risk Factors Only	Both Teacher and Medical Risk Factors
B. Children Identified by Teacher Recommendation or Medical Risk Factors				
Number (in hundred thousands)	223.1	0.5	2.9	0.2
Mean EFSIQ (Standard Error)	96.3 (.62)	95.7 (3.03)	95.7 (1.85)	89.0 (7.57)
School Profile (Teacher Ratings, %)				
Less attentive than most for his/her age	22.40% (.82)[†]	23.33% (13.90)	26.78% (5.37)	60.45% (23.68)
Extremely restless for his/her age (constantly moving)	8.42 (.44)	17.70 (11.28)	8.74 (2.96)	15.21 (13.10)
Intellectual ability is clearly below average for his/her age	18.83 (.67)	37.15 (15.44)	20.80 (3.62)	73.17 (21.37)

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[*] See Appendix C for tests of significance.

[†] Standard errors shown in parentheses.

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Achievement Scores and EFSIQ

Analysis of mean WRAT achievement scores and mean EFSIQ information (Table 22) for children with possible orthopedic problems indicates that children identified by both medical findings and teacher recommendation and by both teachers and parent indicators performed slightly below average, but these differences were not significant. It is interesting that those identified only by the teacher have somewhat higher than average mean WRAT scores, whereas 37% of them were reported as being below average in intellectual ability.

Socioeconomic and Demographic Patterns

Rates of identification were examined across socioeconomic and demographic variables to compare differences in distributional patterns. Table 23 presents these results. Responses of Black parents indicated a slightly higher incidence of physical problems (3.5%) for their children than did those of White parents (2.9%). Medical findings and teacher recommendations, however, identified Black children approximately half as often as White children (teacher recommendations were 0.2% Black and 0.4% White; medical findings were 0.9% Black and 1.5% White). There were no significant trends across income groups or differences based on sex. There were also no apparent differences across age groups except for parent identification for children 10-11 years old. This may be due to the fact that older children tend to have more broken bones or problems that may produce temporary orthopedic problems than do younger children. From the NCHS data, it is not possible to suggest the reason for these differences.

In comparing rates of use for special resources across socioeconomic and demographic factors (Table 24) there appear to be a few differences between availability and use based on these variables. As pointed out previously, the figures in this table represent a very small proportion of the total school population and therefore while patterns are suggestive, care should be taken in drawing broad generalizations from these data. There is only a slight indication in Table 24 that fewer resources may be available for orthopedically handicapped students who are Black, come from rural areas, or are from low-income families.

Table 22[*]

MEAN SCORES ON ACHIEVEMENT TESTS AND MEAN EFSIQ SCORES OF CHILDREN IDENTIFIED AS POTENTIAL CANDIDATES FOR SERVICES FOR THE ORTHOPEDICALLY HANDICAPPED AND CHILDREN NOT SO IDENTIFIED

	Group Mean WRAT Scores (Mean=50 on both)		Group Mean EFSIQ (Mean=100)	Number (in hundred thousands)
	Reading	Math		
Teacher Recommendation or Medical Risk Factors				
Not Identified	50.4 (.31)[†]	50.3 (.45)	96.3 (.62)	223.1
Teacher recommendation but not medical risk factors	50.4 (3.94)	51.0 (4.59)	95.7 (3.03)	.5
Medical risk factors but not teacher recommendation	50.1 (1.61)	49.5 (1.41)	95.7 (1.85)	2.9
Teacher recommendation and medical risk factors	45.9 (2.89)	42.6 (5.76)	89.0 (7.57)	.2
Teacher Recommendation or Parent Responses				
Not Identified	50.5 (.30)	50.4 (.45)	96.3 (.62)	219.7
Teacher recommendation but not parent responses	53.2 (5.47)	54.0 (6.39)	97.9 (5.55)	.4
Parent responses but not teacher recommendation	47.8 (1.24)	48.1 (1.09)	94.6 (1.66)	6.3
Teacher recommendation and parent reponses	44.2 (3.41)	42.0 (4.81)	88.7 (6.19)	.4

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[*] See Appendix C for tests of significance.

[†] Standard errors in parentheses.

Table 23*

SOCIOECONOMIC AND DEMOGRAPHIC CHARACTERISTICS OF CHILDREN IDENTIFIED AS POSSIBLE CANDIDATES FOR SERVICES FOR THE ORTHOPEDICALLY HANDICAPPED

Characteristics	Number of Children in the U.S.†	Percent Identified by Various Indicator Sets (Standard Error)		
		Teacher Recommendation for Orthopedic Services‡	Medical Risk Factors‡	Parent Responses‡
Total	227	.33% (.07)	1.40% (.30)	2.96% (.15)
Race				
Black	31	.21 (.14)	.89 (.33)	3.25% (.56)
White (includes "Other")	196	.35 (.07)	1.48 (.32)	2.91 (.17)
Sex				
Male	115	.30 (.08)	1.52 (.36)	3.14 (.26)
Female	111	.37 (.11)	1.27 (.35)	2.77 (.24)
Income				
Less than $3,000	40	.49 (.24)	1.17 (.32)	3.46 (.48)
$3,000 to $4,999	40	.54 (.23)	1.52 (.53)	3.14 (.50)
$5,000 to $6,999	51	.27 (.13)	1.39 (.45)	2.47 (.35)
$7,000 to $9,999	47	.18 (.11)	1.99 (.59)	3.26 (.31)
$10,000 to $14,999	27	--§	.91 (.33)	2.17 (.52)
$15,000 and above	11	.79 (.59)	.85 (.64)	2.70 (.83)
Don't know/no response	11	.29**(.29)	1.08 (.70)	3.53 (1.08)
Age				
6-7	76	.29 (.11)	1.56 (.43)	2.60 (.32)
8-9	77	.32 (.13)	1.16 (.26)	2.22 (.28)
10-11	74	.39 (.13)	1.49 (.38)	4.09 (.44)
Region				
Northeast	51	.47 (.10)	1.82 (.47)	3.10 (.33)
Midwest	65	.20 (.10)	2.07 (.78)	2.79 (.46)
South	54	.26 (.09)	.94 (.47)	2.91 (.33)
West	56	.43 (.23)	.69 (.31)	3.05 (.39)
Type of Place				
Rural	76	.32 (.13)	1.08 (.29)	2.79 (.34)
Urban, under 50,000	34	.37 (.20)	1.60 (.95)	3.08 (.54)
50,000-250,000 people	17	.53 (.31)	.89 (.75)	3.75 (1.14)
250,000-3 million people	57	.38 (.17)	1.49 (.55)	3.14 (.35)
Over 3 million people	43	.18 (.09)	1.89 (.64)	2.60 (.47)

---

*See Appendix C for tests of significance.

†In hundred thousands.

‡Includes all children so identified, whether or not those children were also identified by another set of indicators.

§No observations in category.

**Sample too small to permit drawing valid conclusions.

Table 24*

SOCIOECONOMIC AND DEMOGRAPHIC STATUS, CHILDREN USING AND NOT USING SPECIAL RESOURCES FOR THE ORTHOPEDICALLY HANDICAPPED WHO WERE RECOMMENDED FOR SUCH RESOURCES BY THE TEACHER

	Percent				Number (in thousands)			
	Total Group Recommended by Teacher†	Resources Used	Resources Available Not Used	Resources Not Available	Total Group Recommended by Teacher†	Resources Used	Resources Available Not Used	Resources Not Available
Total	.3%	.1%	.1%	.1%	75.5	33.3	17.4	12.5
Sex								
Male	.3	.1	.1	.1	34.7	12.4	6.7	6.5
Female	.4	.2	.1	.1	40.8	20.9	10.7	5.9
Race								
Black	.2	.1	-‡	.1	6.5	2.9	-	3.5
White	.4	.2	.1	.0§	69.0	30.4	17.4	8.9
Income								
Under $3,000	.5	.1	.1	.1	19.9	5.0	5.9	5.3
$3,000-$4,999	.5	.2	.0	.2	21.8	6.2	1.9	7.1
$5,000-$6,999	.3	.2	.1	-	13.8	9.1	4.7	-
$7,000-$9,999	.2	.1	-	-	8.4	6.3	-	-
$10,000-$14,999	-	-	-	-	-	-	-	-
Over $15,000	.8	.3	.5	-	8.3	3.5	4.8	-
Age								
6-7	.3	.2	.1	-	21.9	11.9	6.6	-
8-9	.3	.1	.1	.0	24.6	6.7	10.7	3.6
10-11	.4	.2	-	.1	29.0	14.8	-	8.8
Region								
Northeast	.5	.3	.0	.1	24.4	17.1	1.9	5.3
Midwest	.2	.1	-	-	13.1	6.2	-	-
South	.3	.1	.1	.1	14.0	3.5	4.7	3.6
West	.4	.1	.2	.1	24.0	6.5	10.7	3.5
Area Population								
Rural	.3	.2	-	.1	24.8	12.6	-	8.9
Urban, under 50,000	.4	.1	.2	-	12.5	3.3	5.9	-
50,000 to 250,000 people	.5	-	.4	-	8.8	-	6.6	-
250,000 to 3 million people	.4	.2	.1	.1	21.9	9.9	4.8	3.5
Over 3 million people	.2	.2	-	-	7.5	7.5	-	-

---

*Standard errors not generated for these data.

†Total includes children for whom the availability of special resources was not known or may not add due to rounding.

‡No observations in this category.

§Less than 1/10 of 1%.

Summary and Conclusions

With the aid of consultants, items from the NCHS data base were selected that would have some predictive value in identifying children who might be candidates for special services for the orthopedically handicapped. The results of the analysis indicated only a few major findings:

- There was little congruence between the groups of children identified as possible candidates by various indicator sets.
- Doubly identified children (identified by teacher and parent responses, or identified by teacher and medical findings) had profiles indicating far more health problems than children not so identified, although it was not possible to test these differences statistically.
- Slightly more Black children than White children were identified from parent responses, but that difference did not hold for identification from teacher recommendations or medical findings. There were no statistically significant findings for race.
- Children 10-11 years old were identified at significantly higher rates than younger children.
- All groups of children except those identified by both the teacher and medical indicators were achieving at the mean. Those doubly identified by teacher and medical findings were somewhat below the mean although the differences were not statistically significant.

There is no indication from the data as to what a teacher understood it to mean when he/she checked "special provision for orthopedically handicapped," whether physical therapy, school-provided classroom appliances (e.g., special typewriters for those with cerebral palsy), or skills training. With the exception of the notation concerning cerebral palsy, there is little clue from the parent responses as to the severity or permanence of the apparent orthopedic problem. The difficulty subsumed under the statement "has trouble walking" could be as minor as "tires easily on long walks," is pigeon-toed, has a broken leg or a football knee, or is poorly coordinated.

Medical findings are clearcut in some cases, not so in others. For example, a musculo-skeletal-joint disorder that should be noted by an examining physician, does not necessarily require "special provision for the orthopedically handicapped." Even a finding of paralysis is not wholly unequivocal evidence of the need for special orthopedic resources--a partially paralyzed left hand in a right-handed child would result in such a finding as much as would total paralysis below the waist as the result of a spinal injury.

These observations do not mean that analysis of the NCHS data is without value. It does mean, however, that the analysis may pose more questions than it answers. For example, it is curious that there are many more children recommended by teachers for special provision for the orthopedically handicapped when no such handicap was apparent from medical examination findings than there were when a possible need was confirmed by medical findings. This may suggest that pediatric examinations miss problems that are apparent to teachers or could mean that teachers ascribe difficulties in school to relatively insignificant orthopedic disorders when the problem may actually have some other genesis. There may be more support for the later explanation than the former. An orthopedic specialist at Stanford University commented that in his own experience teachers often express great alarm at in-toing in children yet it is extremely common and of little orthopedic consequence. It is also curious why teachers rated such a high proportion of those they identified as orthopedically handicapped as being below average intellectually when the mean WRAT scores of the teacher-only group appear to be somewhat above average. For the moment these issues must remain unanswered.

IV MENTAL HANDICAPS

This section presents comparisons of variables for all children who were recommended by teachers for special resources for either mental retardation or emotional disturbance, and for those not recommended. Since neither doctors nor parents were asked directly whether the child was emotionally disturbed, and only the doctor was asked to report whether the child was mentally retarded or otherwise neurologically impaired, it was necessary to identify indicators from the data.

Mental Retardation

There is very little consensus among clinicians (or among educators) regarding conditions or behaviors that define a mentally retarded or emotionally disturbed child (see Exhibit 3). Therefore, our consultants helped us establish sets of indicators (parent response indicator set, medical risk factors, and test scores) that permit comparisons between different groups of children. Procedures currently advocated (Filler et al., 1975 and Grossman, 1973) for the identification of children as mentally retarded generally suggest using IQ as well as some measure of adaptive behavior. However, as pointed out by Grossman,

> The available adaptive behavioral scales (Vineland, AAMD, etc.,) are not fully satisfactory... They were developed primarily on institutional populations and do not adequately embrace the broad range of behaviors characteristic of mildly retarded children and adults living in the community... Therefore, the ultimate determination of the presence or absence of mental retardation still rests on clinical judgment. Once the diagnosis is made, the adaptive behavior scales are useful in further specifications.
>
> (Grossman, 1973, pp. 20 and 21)

Thus, in practice, IQ scores are most often used as the major criterion for such identification because of their higher reliability in the current setting relative to current measures of adaptive behavior (Hobbs, Vol. I, pp. 210 and 211, 1975; Adams, 1973).

Exhibit 3

THE DEFINITION OF MENTAL RETARDATION IN CHILDREN

The meaning of the term "mental retardation" is at the core of an apparently unresolvable controversy. Filler et al. (1975) have identified three possible approaches to the conceptualization of mental retardation:

> Classical Approach--Intelligence is a hypothetical construct that cannot be measured directly but may be inferred from performance on standardized tests. On the basis of this approach, mental retardation is defined by a low score on any one of many standardized tests, converted to a low IQ.
>
> Behaviorist Approach--Mental retardation is manifested by a "limited repertory of behavior" (Bijou, 1963). According to this view, behavior itself should be labeled according to the degrees of intelligence rather than by creating a latent construct to which degrees of intelligence are ascribed. In this model, IQ scores, rather than being considered a measure of intelligence, are treated as an indicator of very specific behavior.
>
> Social Deviance Approach--A number of sociologists use the term "mental retardation" as a label to indicate deviance from societal expectations. According to this view, IQ tests are used to measure how closely an individual meets social normals, so that an individual might be considered mentally retarded in one context and not in another. Such a situation is usually most apparent in minority children whose home culture may be quite different from that met in school. See, for example, "The Six-Hour Retarded Child," a 1969 report by the President's Committee on Mental Retardation. Some advocates of this approach to definition propose the use of "pluralistic" norms which use IQ as only one of several measures of adaptation. To take sociocultural factors into account, an individual's IQ score as well as a measure of adaptive behavior and medical history are compared to norms based on comparable scores for other children with similar sociocultural backgrounds. (See also Mercer, 1973; Becker, 1963; and Farber, 1968.)

In the Annual Review of Mental Retardation, Joseph Wortis (1970) has pointed out that both Binet and Simon, who developed the first IQ test, attempted to disassociate themselves from the common tendency to view IQ scores as if they related to some innate mental capacity. More than fifty years ago, Binet and Simon wrote:

> As a general rule, the children classed as retarded are the victims of disease, constitutional debility, or malnutrition. We find included in our lists some who are the children of migratory parents; some who have been kept from school; some who have attended a religious school, where they learned little but sewing and writing; some who have changed their school too often; some also who are foreigners and understand little French, and lastly, some who have been kept back in their studies by unrecognized myopia ... (quoted in Wortis, 1970, p. 1).

Exhibit 3 (Concluded)

In a study of intelligence and brain damage, B. A. Maher has discussed the difficulty in identifying mental retardation and suggested that the diagnosis is culture-bound and based not so much on an individual's intellectual characteristics as on some measure of social adjustment:

> What constitutes mentally retarded behavior depends to a large extent upon the society which happens to be making the judgment. An individual who does not create a problem for others in his social environment and who manages to become self-supporting is usually not defined as mentally retarded no matter what his test IQ may be. Mental retardation is primarily a socially defined phenomenon, and it is in large part meaningless to speak of mental retardation without this criterion in mind. (Maher, 1963, p. 238)

Thus, the controversy over the use of IQ scores in the diagnosis and placement of children in classes for the mentally retarded creates a serious quandry since "disregard of measured intelligence opens the door to subjective unvalidated judgment, while dependence on an IQ score creates a false illusion of homogeneity." (Wortis, 1970, p. 5) Thus, Wortis, concluded:

> On the whole, we do not get very far with our present classification, since so many cases are not very specifically diagnosable. With the exception of Mongolism, most diagnoses are still based on clinical judgments with strongly subjective influences. (Wortis, 1970, p. 4)

FURTHER READING

Becker, H. S., Outsiders: Studies in the Sociology of Deviance (Free Press, New York, New York, 1963).

Bijou, S. W., "Theory and Research in Mental (Developmental) Retardation," Psychological Record, Volume 13, pp. 95-110 (1963).

Conley, R. W., The Economics of Mental Retardation (The Johns Hopkins University Press, Baltimore, Maryland, 1973).

Farber, B., Mental Retardation: Its Social Context and Social Consequences (Houghton Mifflin, Boston, Massachusetts, 1968).

Filler, John W., Jr. et al., "Mental Retardation," in Issues in the Classification of Children, Nicholas Hobbs, Ed., Vol. I (Jossey-Bass, San Francisco, California, 1975).

Maher, B. A., "Intelligence and Brain Damage," in Handbook of Mental Deficiency, N. R. Ellis, Ed., pp. 224-252 (McGraw-Hill, New York, New York, 1963).

Mercer, J. R., Labeling the Mentally Retarded (University of California Press, Berkeley, California, 1973).

President's Committee on Mental Retardation, "The Six-Hour Retarded Child," Government Printing Office, Washington, D.C. (1969).

Wortis, J., Ed., Mental Retardation: An Annual Review II (Greene and Stratton, Inc., New York, New York, 1970).

To aid in comparing rates of identification based on information in the NCHS sample, separate sets of indicators were derived by consultants from the sample to identify children who might be mentally retarded. From the parent responses, it was decided that an indication of the possibility of mental retardation could be obtained from at least three positive responses to the following items:

(1) Learning speed slower than others
(2) First walked at 1-1/2 years or older
(3) Spoke first real word at 1-1/2 years or older
(4) Any problem with the way he/she talks
(5) Comparative age of friends is younger than the child.

These parental response items represent factors that could be indicative of possible mental retardation if several occur together. A child who walks late, talks late, and is reported to be slower to learn than others is more likely to be mentally retarded than a child who shows none or only one of these characteristics.

The teacher's identification of the child as mentally retarded was signified by a positive response to the question: "If the following special resources were available, check those you would recommend for this child: ... Class for mentally retarded."

The indicators from the medical examination, noted by the examining pediatrician, that were considered to indicate risk of possible mental retardation were at least one of the following:

(1) Mentally retarded
(2) Acquired or traumatic neuroresidual damage
(3) Downs' syndrome or other developmental condition
(4) Other neurological condition.

Note that only Items 1 and 3 (a diagnosis of mentally retarded or the observation of Downs' syndrome recorded by the pediatrician) are considered indications that a child actually is mentally retarded.

Finally, the vocabulary and block design subtests from the Wechsler Intelligence Scale for Children (WISC) were administered as part of the

NCHS psychological test battery. The scores from these subtests were then used by NCHS to estimate the Wechsler full-scale IQ score for each child. An earlier study by NCHS concluded that these subtests would serve as a crude, but valid, screening tool (see p. 32, Mercer, NCHS, Series 2, #47). For a full discussion of these subtests and their use to estimate full-scale IQ, see NCHS Monographs 15 and 47 in NCHS Series 2. These estimated full-scale IQ scores (called EFSIQ in this report) were used because they offered the most reliable test indication in the data base that a child might or might not be a potential candidate for services for the mentally retarded. An EFSIQ of 69 based on the Wechsler scale, which represents two standard deviations below the mean, is accepted by the American Association on Mental Deficiency (AAMD) as an indicator of mental retardation. The following scale is used by the AAMD:

Mild retardation:	Standard deviation range -2.01 to -3.00 (Wechsler) IQ range 69-55
Moderate retardation:	Standard deviation range -3.01 to -4.00 (Wechsler) IQ range 54-40
Severe retardation:	Standard deviation range -4.01 to -5.00 (Wechsler) IQ range 39-25
Profound retardation:	Standard deviation range below -5.01 (Wechsler) IQ range 24 and below.

The definition used by the AAMD also suggests an evaluation of a child's adaptive behavior. The parent and teacher observations of behaviors and social interactions can be considered a crude indication of adaptive behavior. However, there was no valid measure of adaptive behavior in the NCHS data and, in any event, as noted in Exhibit 3, current measures of behavior have severe limitations. Of all the children in school, no child in the NCHS sample had an EFSIQ below 53. The indicators used are summarized in Table 25.

Comparison of Overall Rates of Identification and Extent of Agreement Between Indicators

For children who might be identified as potential candidates for services for the mentally retarded using various indicator sets from the

Table 25

INDICATORS AND RISK FACTORS USED TO IDENTIFY CHILDREN WHO ARE POTENTIAL CANDIDATES FOR SERVICES FOR THE MENTALLY RETARDED

Teacher

In response to the question, "If the following special resources were available, check those you would recommend for this child," checked "Class for the mentally retarded."

Test

Received an estimated full-scale IQ (EFSIQ) rating of 69 or below (see text for discussion).

Parent Responses

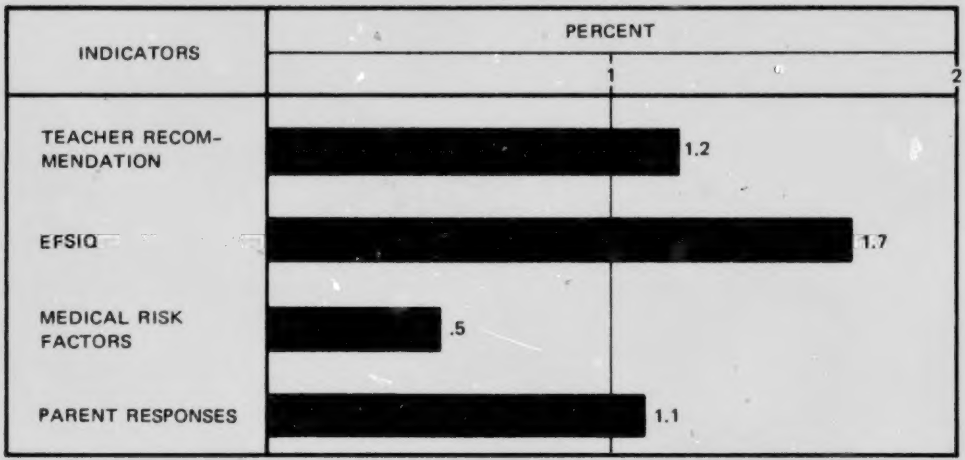
Parent gave at least three positive responses to the following items:

- Learning speed slower than others
- First walked at 1-1/2 years or older
- Spoke first real word at 1-1/2 years or older
- Any problem with the way he/she talks
- Comparative age of friends younger than child.

Medical Examination

Diagnosis of mentally retarded by pediatrician, OR
Findings of acquired or traumatic neuroresidual damage, OR
Downs' syndrome or other developmental condition noted, OR
Other neurological condition noted.

NCHS sample, it was found that (Figure 10), with the exception of medical findings, there appeared to be only small differences in overall rates. Estimates which are commonly used, as shown in Table 1, range from 1.5% to 3.0% of the school population. While the rates reported in Figure 10 are not intended to validate the estimated prevalence of mental retardation, it is nevertheless interesting that even using EFSIQ alone, the rate of potential identification as mentally retarded is far below the upper estimate of 3% in Table 1 for children in school.



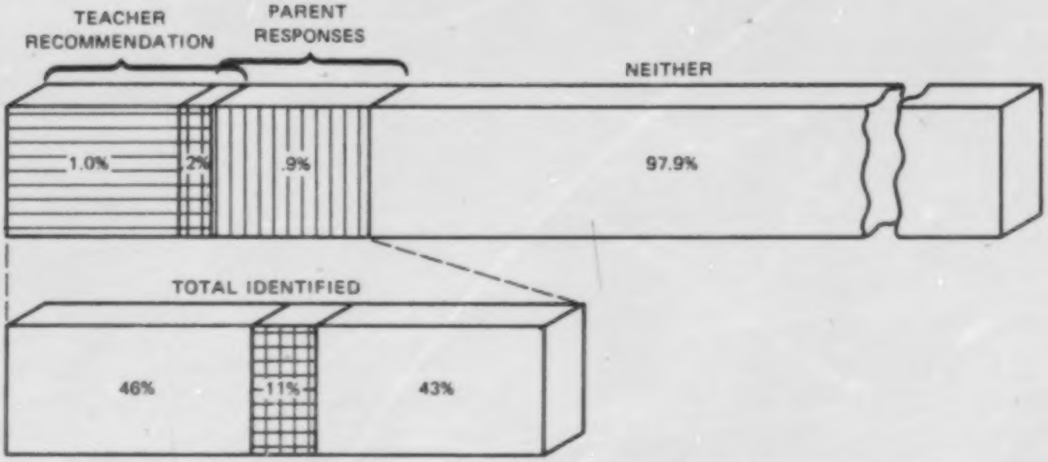
*Estimated rates represent the population in school for whom school data were available. Estimated rates for children not in school are presented in Section VII.

FIGURE 10 RATES OF THE POTENTIAL NEED FOR SPECIAL RESOURCES FOR THE MENTALLY RETARDED USING VARIOUS INDICATORS*

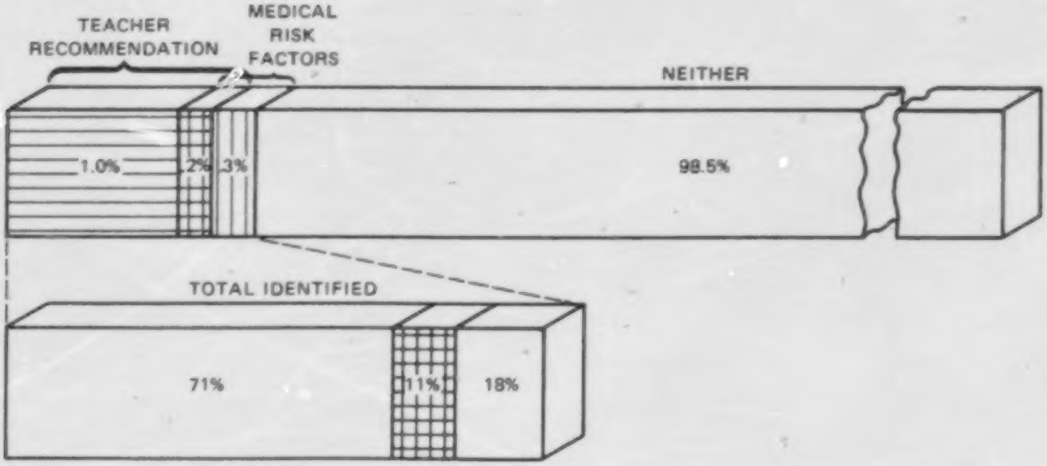
In comparing the extent to which these indicators tend to identify the same children, these data indicate very little agreement (Figure 11). The cross-hatched area in each bar graph represents the overlap or agreement between various indicator sets. The overlap in identification based on teacher recommendation, medical risk factors, parent responses, and EFSIQ was no more than 0.3% for the total population. The extent of agreement was greatest when medical risk factors were applied; 18% of the identified children in Figure 11(b) were identified by medical risk factors alone, but 11% were identified by both teachers and medical risk factors (over a third of the total identified by medical risk factors). Of those identified by medical risk factors nearly one quarter were also identified by parent responses (Figure 11d).

For all children recommended by teachers for special resources for the mentally retarded (1.2% of the total school population), 65% were receiving such resources, 16% had resources available but were not using them, and 19% did not have any resources available. For all types of handicaps, this is the highest rate of availability and use of resources (see Table 4). However, of those children receiving special resources for the mentally retarded, only 24% had EFSIQ scores of 69 or below (see Table 26). It is particularly interesting to note that of the group of children for whom resources were not available, over half (51%) had EFSIQ scores of 69 or below. Of children using special resources for the mentally retarded, only 15% were identified by medical risk factors and 23% by parent indicators.

Figure 12 presents the distribution of children recommended by teachers for classes for the mentally retarded across EFSIQ scores. Most students identified by the teacher had an EFSIQ score of between 71 and 85, with about 60% of all recommended students falling within this range. Only 25% of the recommended group had an EFSIQ below 70, and about 14% of the students had EFSIQ scores above 85. However, this figure presents a somewhat distorted picture of what is actually happening in terms of rates of identification based on EFSIQ. Figure 13 shows the relationship between recommendation and EFSIQ scores in a different context. By looking at the percent of children in the NCHS sample in a given EFSIQ

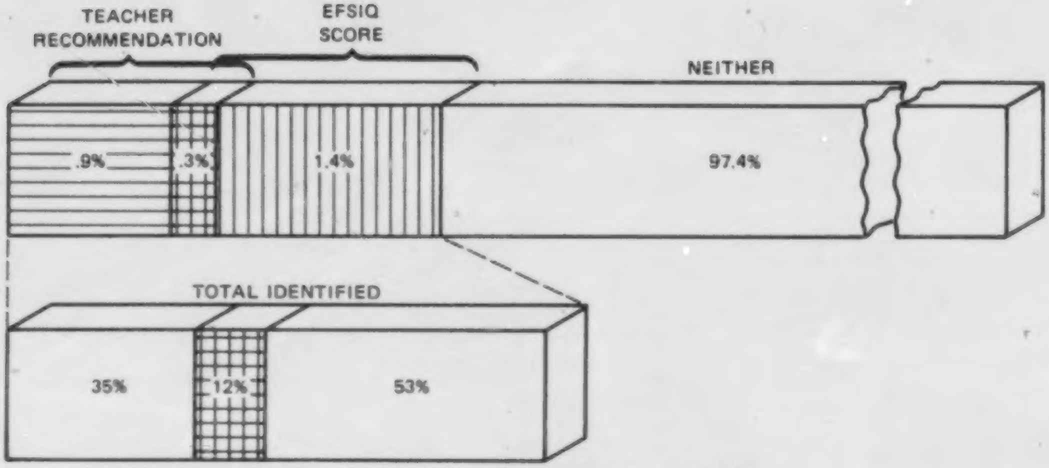


(a) AGREEMENT BETWEEN TEACHER AND PARENT

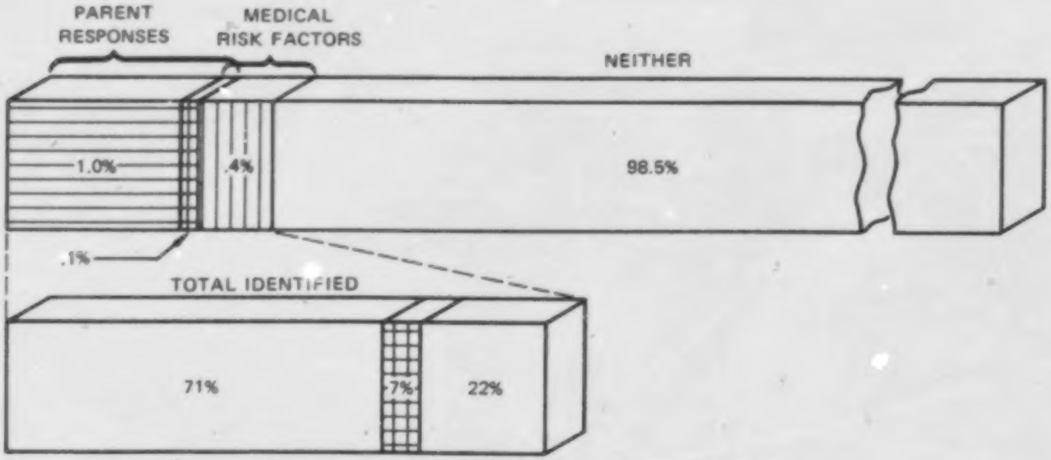


(b) AGREEMENT BETWEEN TEACHER AND PEDIATRICIAN

FIGURE 11 IDENTIFICATION OF CHILDREN WHO MAY NEED SERVICES FOR THE MENTALLY RETARDED

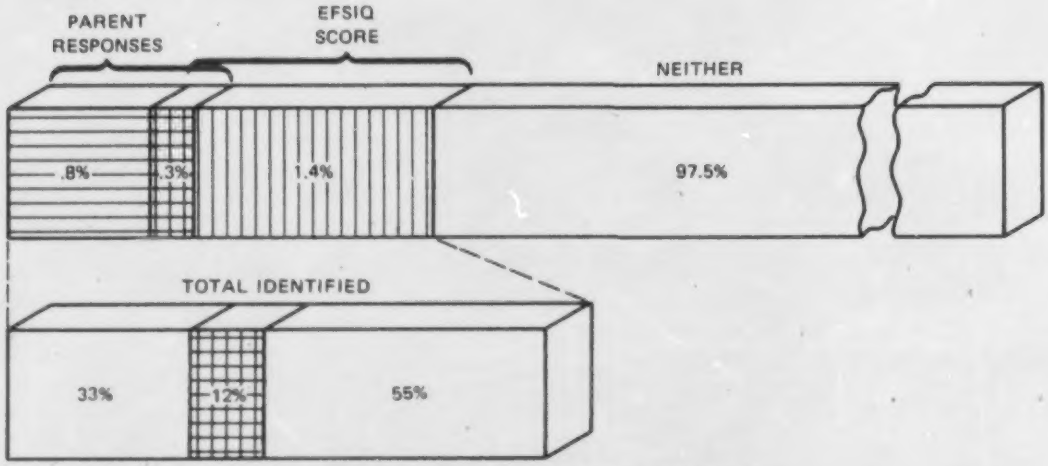


(c) AGREEMENT BETWEEN TEACHER AND TEST

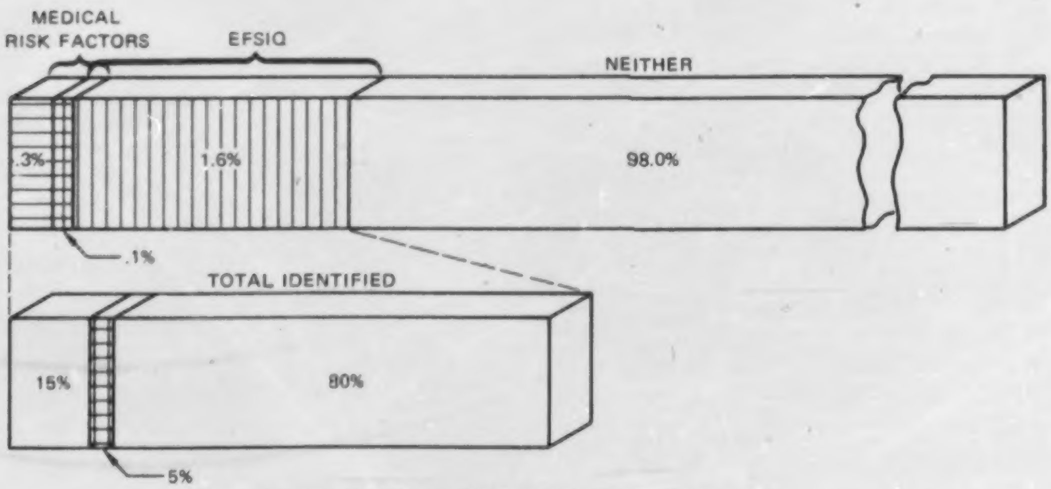


(d) AGREEMENT BETWEEN PARENT AND PEDIATRICIAN

FIGURE 11 IDENTIFICATION OF CHILDREN WHO MAY NEED SERVICES FOR THE MENTALLY RETARDED (Continued)



(e) AGREEMENT BETWEEN PARENT AND TEST



(f) AGREEMENT BETWEEN PEDIATRICIAN AND TEST

FIGURE 11 IDENTIFICATION OF CHILDREN WHO MAY NEED SERVICES FOR THE MENTALLY RETARDED (Concluded)

Table 26

APPLICATION OF INDICATORS TO POPULATION FOR WHOM TEACHERS HAD RECOMMENDED SPECIAL RESOURCES FOR THE MENTALLY RETARDED

Source of Identification	Percent of Total Teacher-Identified Group	Percent of Group Using Special Resources	Percent of Group Not Using Special Resources (Resources Available)	Percent of Group Without Resources Available
Medical Risk Factors				
Identified	14%	15%	19%	9%
Not identified	86	85	81	91
Total	100	100	100	100
Parent Risk Factors				
Identified	19	23	7	22
Not identified	81	77	93	78
Total	100	100	100	100
EFSIQ of 69 or Below				
Identified	25	24	11	51
Not identified	75	76	89	49
Total	100	100	100	100

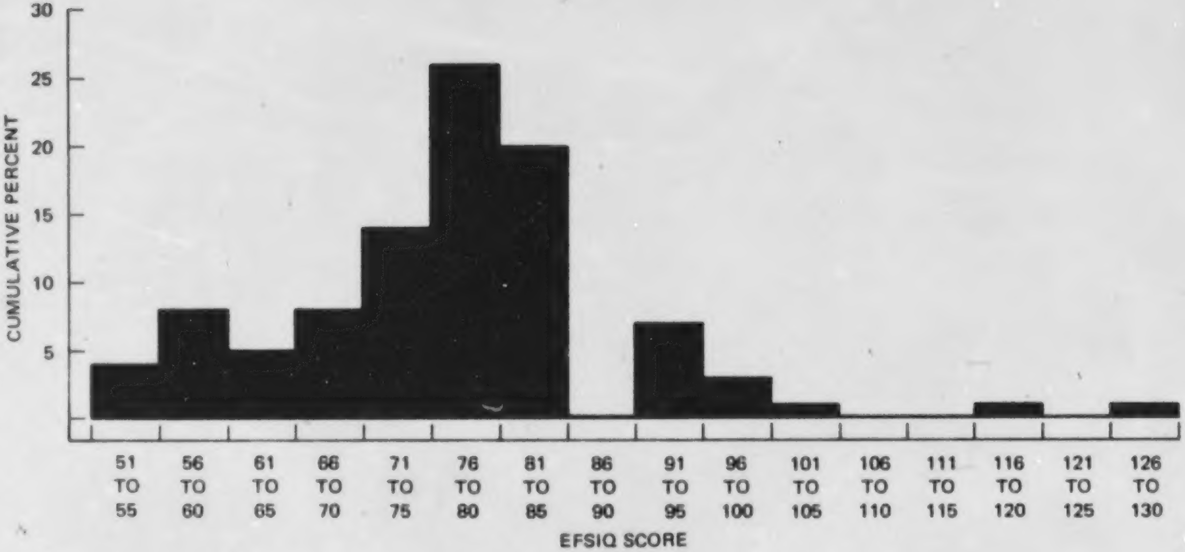


FIGURE 12 DISTRIBUTION OF CHILDREN IDENTIFIED BY THE TEACHER AS NEEDING SPECIAL RESOURCES FOR THE MENTALLY RETARDED OVER EFSIQ SCORES

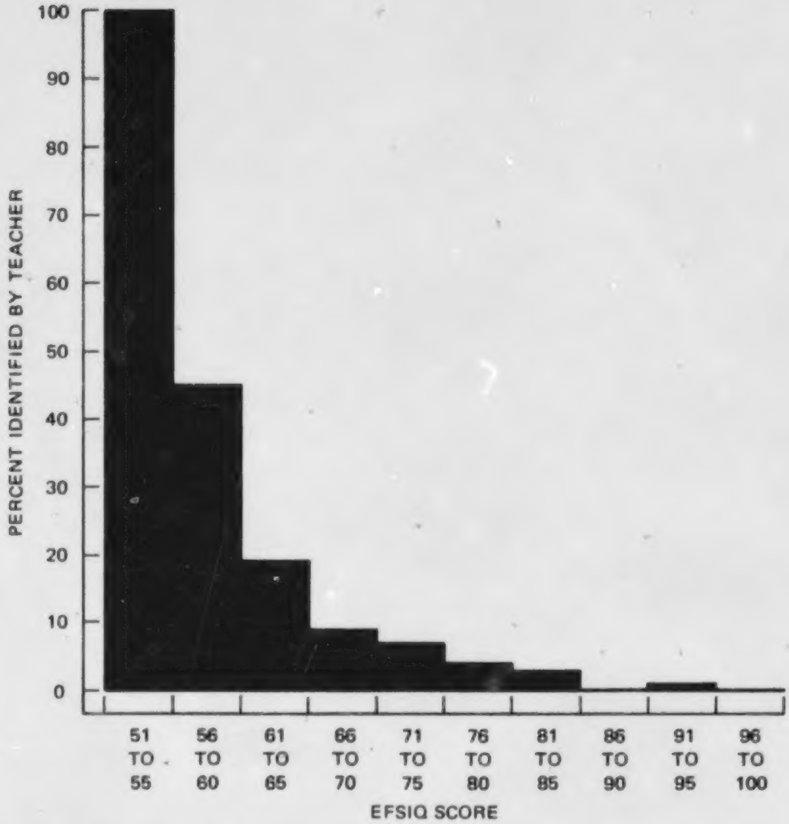


FIGURE 13 PERCENT OF CHILDREN WITH SPECIFIED EFSIQ WHO WERE IDENTIFIED BY THE TEACHER AS NEEDING SPECIAL RESOURCES FOR THE MENTALLY RETARDED

category who were recommended by the teacher as needing special resources for the mentally retarded, a much different picture is presented.

For example, of all the children in the sample with EFSIQ scores between 51 and 55, 100% were recommended by the teacher for classes for the mentally retarded. For children with scores in the range 61 to 65, only 19% were recommended by the teacher for such special resources. The rate of identification continues to drop dramatically as EFSIQ scores increase. Thus, for children with EFSIQ scores in the range 70 to 85 (which at the time of the survey would have been considered "borderline mentally retarded") only about 4% of the total group were recommended for classes for the mentally retarded. Because the total number of children who have scores in this range is large, 4% of this group represents a much larger number of children than the number who scored below 70. Therefore, the fact that there were many more children with EFSIQ scores in the range 70 to 85 who were recommended for classes for the mentally retarded by teachers is related to the distribution of children rather than to a higher rate of identification of children in that range.

It is important to emphasize that during the time of the NCHS survey in the early 1960s, the 1959 AAMD definition of mental retardation was the authoritative classification standard. According to this standard, a score between 70 and 85 on an IQ test would have been sufficient to qualify a child as "borderline mentally retarded." This category was eliminated in the AAMD revised classification scheme on advice of the AAMD Task Force on Classification and Terminology. It is the 1973 AAMD standard of 69 and below that has been used throughout this section as an indicator of possible need for services for the mentally retarded. If we had used the 1959 standard, the fact that such a small proportion of children with scores between 70 and 85 were recommended for services by teachers (only 4%) would undoubtedly have made the lack of agreement between indicators of possible need much greater.

School Behavior Profiles of Children Identified as Potential Candidates for Services for the Mentally Retarded

Table 27 presents the school behavior profiles for children recommended for special resources for the mentally retarded by the teacher or selected from the data as possible candidates for such services on the basis of an EFSIQ of 69 or below.

Several significant differences in school behaviors were found between the three groups of children identified by the teacher, the EFSIQ, or both (Columns 2-4), and the group not identified by teacher recommendations and having EFSIQs of 70 or above. Children identified as mentally retarded by teacher recommendation, EFSIQ, or both, were more frequently reported to have repeated a grade, were more often scored as less attentive than most children, were more often scored as "never chosen as a leader in play," and "almost always chosen last," and were rated as having below-average intellectual ability.

Within the three groups, however, there are also significant differences in reported behaviors. There is a consistent pattern in the rating of two classroom behaviors--less attentive and constantly moving-- and in the teacher's rating intellectual ability as below average. Significantly more children who were identified by teacher recommendation and by an EFSIQ of 69 or below were rated as being more likely to exhibit the following traits than the other two groups:

Less attentive, 89.5%
Constantly moving, 45.9%
Intellectual ability below average, 100%.

Children identified by teacher recommendation alone were the next most likely to exhibit these traits:

Less attentive, 68.7%
Constantly moving, 37.4%
Intellectual ability below average, 92.9%.

Table 27*

SCHOOL BEHAVIOR PROFILES OF CHILDREN RECOMMENDED BY TEACHERS TO RECEIVE RESOURCES FOR THE MENTALLY RETARDED, CHILDREN HAVING AN EFSIQ OF 69 OR BELOW, CHILDREN IDENTIFIED BY BOTH THE TEACHER AND EFSIQ, AND CHILDREN IDENTIFIED BY NEITHER

	Neither Teacher nor EFSIQ	Teacher Only	Low EFSIQ Only	Both Teacher and Low EFSIQ
Number (in hundred thousands)	220.8	2.1	3.2	.7
Mean EFSIQ	97.0	82.3	66.2	61.5
(Standard Error)	(.6)	(1.6)	(.4)	(1.1)
School Profile (Teacher Ratings, %)				
Academic Standing				
Repeated a grade	12.8%	59.1%	44.9%	69.4%
	(1.0)[†]	(8.9)	(2.6)	(14.5)
School Behavior				
Less attentive than most for his/her age	21.6	68.7	43.1	89.5
	(.8)	(4.9)	(4.8)	(8.2)
Extremely restless for his/her age (constantly moving)	8.0	37.4	9.9	45.9
	(.5)	(6.3)	(4.4)	(9.5)
Frequently accused of fighting by other children	6.1	23.9	8.1	22.9
	(.4)	(7.9)	(4.1)	(9.9)
Too "rough" with other children	5.0	16.5	5.6	17.9
	(.3)	(4.8)	(2.7)	(8.2)
Frequently injured	2.6	11.3	1.2	4.8
	(.2)	(5.0)	(1.4)	(5.8)
Other children's parent complain about his/her behavior	0.7	2.9	-[‡]	-
	(.1)	(2.2)		

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[*] See Appendix C for tests of statistical significance.

[†] Standard errors shown in parentheses.

[‡] No observations in category.

Table 27[*] (Continued)

SCHOOL BEHAVIOR PROFILES OF CHILDREN RECOMMENDED BY TEACHERS TO RECEIVE RESOURCES FOR THE MENTALLY RETARDED, CHILDREN HAVING AN EFSIQ OF 69 OR BELOW, CHILDREN IDENTIFIED BY BOTH THE TEACHER AND EFSIQ, AND CHILDREN IDENTIFIED BY NEITHER

	Neither Teacher nor EFSIQ	Teacher Only	Low EFSIQ Only	Both Teacher and Low EFSIQ
School Behavior (Continued)				
Discipline doesn't work	1.4% (.2)[†]	1.8% (2.0)	1.9% (1.7)	23.9% (9.6)
Specific disciplinary action frequently required	7.4 (.4)	26.1 (6.1)	8.0 (4.7)	43.1 (13.0)
Almost always chosen last in children's play	11.6 (.5)	24.2 (8.3)	41.4 (9.5)	55.9 (17.4)
Almost never chosen as leader in children's play	25.1 (.6)	59.7 (5.7)	55.2 (11.4)	73.8 (11.0)
Intellectual Ability				
Intellectual ability is clearly below average (bottom 25%) for age	17.5 (.6)	92.9 (3.4)	59.6 (7.8)	100.0 (0.0)

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[*] See Appendix C for tests of statistical significance.

[†] Standard errors shown in parentheses.

Finally, children identified only by an EFSIQ of 69 or below were reported to exhibit these traits at a significantly lower rate:

Less attentive, 43.1%
Constantly moving, 9.9%
Intellectual ability below average, 59.6%.

It is of particular interest to note that children who were identified only by the EFSIQ (scores of 69 or below) were identified at very low rates as having aggressive behaviors in school. This group more closely resemble children not identified by either indicator than those identified by either the teacher or teacher and test. Children recommended only by the teacher and by teacher and test were far more frequently rated as exhibiting aggressive traits in school such as fighting, restlessness, rough play with other children, and requiring frequent discipline than those identified by the test alone.

Finally, almost 24% of the children identified by both the teacher and the EFSIQ score were rated as not responding to discipline compared with less than 2% for each of the other three groups.

Table 28 displays comparisons of school behaviors for children identified by the teacher, by the parent indicators, both, or neither. Only children identified by both the teacher and the parent indicator set had a mean EFSIQ score below 69.

A pattern similar to that found in Table 27 is found in the comparison between reported school behaviors of children recommended by teachers and those selected on the basis of parent indicators. All three groups identified by one or both indicators appear to have behaviors quite different from those not identified by either indicator, in that they tended to exhibit more extreme behavior patterns. The exceptions are for ratings of frequency of injuries and complaints by parents of other children. For the most part, however, students selected by both teacher recommendations and parent indicators appeared to be the most extreme group in terms of reported behaviors. The only exception was the rate at which they were accused of fighting and being too rough with other children. The group

Table 28*

SCHOOL BEHAVIOR PROFILES OF CHILDREN RECOMMENDED BY TEACHERS FOR CLASSES FOR THE MENTALLY RETARDED, CHILDREN SELECTED FROM PARENT INDICATORS, CHILDREN IDENTIFIED BY BOTH TEACHER AND PARENT, AND CHILDREN IDENTIFIED BY NEITHER

	Neither Teacher Nor Parent Responses	Teacher Only	Parent Responses Only	Both Teacher and Parent Responses
Number (in hundred thousands)	221.9	2.3	2.1	.5
Mean EFSIQ (Standard Error)	96.6 (.6)	79.6 (2.1)	84.4 (2.9)	66.0 (2.0)
School Profile (Teacher Ratings, %)				
Academic Standing				
Repeated a grade	12.9% (1.0)†	61.7% (8.1)	51.5% (6.3)	61.5% (13.5)
School Behavior				
Less attentive than most for his/her ages	21.7 (.9)	68.7 (5.4)	48.2 (7.5)	94.5 (6.7)
Extremely restless for his/her age (constantly moving)	7.9 (.4)	39.2 (6.6)	23.7 (3.8)	40.7 (13.7)
Frequently accused of fighting by other children	6.1 (.4)	25.2 (7.0)	9.0 (3.4)	17.1 (9.8)
Too "rough" with other children	5.0 (.3)	17.6 (4.4)	9.4 (3.8)	13.4 (9.7)
Frequently injured	2.5 (.2)	12.0 (4.7)	1.6 (1.7)	-‡
Other children's parents complain about his/her behavior	.7 (.1)	2.7 (2.1)	-	-

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[*] See Appendix C for tests of significance.

[†] Standard errors shown in parentheses.

[‡] No observations in this category.

Table 28[*] (Continued)

SCHOOL BEHAVIOR PROFILES OF CHILDREN RECOMMENDED BY TEACHERS FOR CLASSES FOR THE MENTALLY RETARDED, CHILDREN SELECTED FROM PARENT INDICATORS, CHILDREN IDENTIFIED BY BOTH TEACHER AND PARENT, AND CHILDREN IDENTIFIED BY NEITHER

	Neither Teacher Nor Parent Responses	Teacher Only	Parent Responses Only	Both Teacher and Parent Responses
School Behavior (Continued)				
Discipline doesn't work	1.4	5.0	3.0	17.4
	(.2)[†]	(4.0)	(2.5)	(10.5)
Specific disciplinary action	7.3	26.0	12.1	47.5
frequently required	(.4)	(5.0)	(5.0)	(12.5)
Almost always chosen last	11.9	24.5	25.7	53.4
in children's play	(.6)	(8.0)	(6.6)	(16.3)
Almost never chosen as leader	25.2	60.4	60.4	71.9
in children's play	(.7)	(5.3)	(8.6)	(14.6)
Intellectual Ability				
Intellectual ability is clearly	17.8	93.3	41.9	100.0
below average (bottom 25%)	(.6)	(3.3)	(10.3)	(0.0)
for age				

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[*] See Appendix C for tests of significance.

[†] Standard errors shown in parentheses.

rated highest on these two behaviors were those children recommended only by the teacher and the lowest-rated group was those recommended only by the parent indicators.

For children selected by the teacher, by medical risk factors, or both, Table 29 shows school behavior profiles for each group and for those not selected by any indicator. For children identified by medical risk factors alone or by neither indicator, there was little difference in teachers' ratings of school behaviors. In fact, children rated by medical factors alone appear to be slightly more attentive and more often selected as a leader in games and play activities than the group of children not identified. The mean EFSIQ score for the group identified only by medical factors (97.4) shows little difference from the nonidentified group (96.5). On the other hand, children identified by both teachers and medical risk factors seem to have school behaviors that indicate far more disruptive patterns of behavior and their mean EFSIQ score (70.4) indicates that this group of children is at the borderline EFSIQ cut-off (EFSIQ of 69), indicating that some of them may possibly need services for the mentally retarded. This is, however, an extremely small proportion of the total school population and represents only about 40,000 children.

In a further attempt to explore factors that might account for recommendations for special resources for the mentally retarded, developmental profiles and home behavior profiles of the children were studied. These findings are presented in Tables 30 and 31.

For the most part, children recommended for special services for the mentally retarded by the teacher and having EFSIQ scores of 69 or below had some behaviors (as rated by parents) quite different from children not identified by either teacher or by a low EFSIQ (Table 30). The doubly identified group were reported to have far more health and development problems than children not so identified (Table 31). Thus, although it is not clear whether the children identified as mentally retarded by teacher and test can be classified as genuinely mentally retarded, it is evident that they exhibit markedly different school and home behaviors, and are likely to have a history of health and development problems.

Table 29*

SCHOOL BEHAVIOR PROFILES OF CHILDREN RECOMMENDED BY TEACHERS TO RECEIVE RESOURCES FOR THE MENTALLY RETARDED, CHILDREN IDENTIFIED BY MEDICAL RISK FACTORS, CHILDREN IDENTIFIED BY BOTH TEACHER AND MEDICAL RISK FACTORS, AND CHILDREN IDENTIFIED BY NEITHER

	Neither Teacher nor Medical Risk Factors	Teacher Only	Medical Risk Factors Only	Both Teacher and Medical Risk Factors
Number (in hundred thousands)	223.4	2.4	.6	.4
Mean EFSIQ (Standard Error)	96.5 (.6)	78.1 (2.0)	97.4 (3.0)	70.4 (5.2)
School Profile (Teacher Ratings, %				
Academic Standing				
Repeated a grade	12.6	59.9	17.2	48.6
School Behavior				
Less attentive than most for his/her age	21.3	67.1	10.7	64.1
Extremely restless for his/her age (constantly moving)	7.8	39.9	7.1	28.2
Frequently accused of fighting by other children	6.2	23.7	-†	22.9
Too "rough" with other children	5.0	16.2	4.3	20.3
Frequently injured	2.5	11.3	-	-
Other children's parents complain about his/her behavior	.7	2.5	-	-

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[*] Standard errors not generated for these data.

[†] No observations in this category

Table 29[*] (Continued)

SCHOOL BEHAVIOR PROFILES OF CHILDREN RECOMMENDED BY TEACHERS TO RECEIVE RESOURCES FOR THE MENTALLY RETARDED, CHILDREN IDENTIFIED BY MEDICAL RISK FACTORS, CHILDREN IDENTIFIED BY BOTH TEACHER AND MEDICAL RISK FACTORS, AND CHILDREN IDENTIFIED BY NEITHER

	Neither Teacher nor Medical Risk Factors	Teacher Only	Medical Risk Factors Only	Both Teacher and Medical Risk Factors
School Behavior (Continued)				
Discipline doesn't work	1.4	6.7	4.3	11.7
Specific disciplinary action frequently required	6.7	27.0	4.3	25.3
Almost always chosen last in children's play	10.3	23.0	2.8	29.2
Almost never chosen as leader in children's play	21.3	47.1	11.6	51.9
Intellectual Ability				
Intellectual ability is clearly below average (bottom 25%) for age	17.2	87.5	28.1	87.6

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[*] Standard errors not generated for these data.

Table 30*

HOME BEHAVIOR PROFILES OF CHILDREN RECOMMENDED BY TEACHERS AS NEEDING RESOURCES FOR THE MENTALLY RETARDED, CHILDREN IDENTIFIED BY LOW EFSIQ SCORES, CHILDREN IDENTIFIED BY BOTH TEACHERS AND LOW EFSIQ, AND CHILDREN IDENTIFIED BY NEITHER

	Neither Teacher nor EFSIQ	Teacher Only	Low EFSIQ Only	Both Teacher and Low EFSIQ
Number (in hundred thousands)	220.8	2.1	3.2	.7
Mean EFSIQ	97.0	82.3	66.2	61.5
(Standard Error)	(.6)	(1.6)	(.4)	(1.05)
Home Behavior Variables (Rated by Parent, %)				
Learning speed slower than other children	3.2	22.4	26.2	73.3
Did not attend kindergarten or nursery school	29.8	33.0	78.7	68.8
Has trouble reading or doing fine work	4.2	6.1	7.3	18.4
Has only a few friends	37.0	51.6	46.2	65.2
Has difficulty getting along with other children	4.1	9.1	7.9	26.3
Is rather high-strung, tense and nervous	17.0	34.4	20.9	38.2
Has very strong temper, loses it easily	17.2	19.2	19.7	18.7
A foreign language is spoken in the home	10.5	5.8	11.0	3.2

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*Standard errors were not generated for these data.

Table 31[*]

DEVELOPMENTAL PROFILES OF CHILDREN RECOMMENDED BY TEACHERS TO RECEIVE RESOURCES FOR THE MENTALLY RETARDED, CHILDREN IDENTIFIED BY LOW EFSIQ, CHILDREN IDENTIFIED BY BOTH TEACHERS AND EFSIQ, AND CHILDREN IDENTIFIED BY NEITHER

	Neither Teacher nor EFSIQ	Teacher Only	Low EFSIQ Only	Both Teacher and Low EFSIQ
Number (in hundred thousands)	220.8	2.1	3.2	.7
Mean EFSIQ	97.0	82.3	66.2	61.5
(Standard Error)	(.6)	(1.6)	(.4)	(1.1)
Health/Developmental Variables (Rated by Parent, %)				
Birth injury noted	-[†]	-	-	0.4
Weight under 5 lbs. at birth	2.8	8.0	4.8	11.0
Weight over 10 lbs. at birth	1.2	4.0	2.9	-
Poor health at age 1	1.5	8.5	3.6	13.5
First walked after 1.5 years	3.0	12.3	13.4	43.4
Spoke first real word after 1.5 years	8.6	19.9	23.8	54.0
Has been knocked unconscious	3.3	8.5	6.7	14.4
Has had a convulsion	3.0	13.7	.9	14.2
Has trouble hearing	4.2	4.6	6.7	9.7

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[*] Standard errors were not generated for these data.

[†] No observations in this category.

It is of interest to note the differences between children identified only by low EFSIQ scores and children identified only by teacher recommendation. Children identified only by low EFSIQ scores were twice as likely not to have attended kindergarten or nursery school as children identified only by teacher recommendation (78.7% against 33%), and were almost twice as likely to come from a home where a foreign language was spoken (11% against 5.8%). On the other hand, children recommended only by the teacher were much more likely to be scored as "rather high-strung, tense and nervous" (34.4% against 20.9%). In terms of health, children identified by the teacher and by the teacher and test were much more likely to have had a convulsion than children identified only by EFSIQ score (13.7% and 14.2% against 0.9%).

Tables 32 and 33 show behavior profiles and health factors for children recommended by the teacher and those identified by the parent or both. The most important differences between these groups of children is that those identified by either the teacher, parent, or both were reported at a much higher rate as having only a few friends, having difficulty getting along with other children, and being tense and nervous. Those identified by parent response indicators or both teacher and parent response indicators were reported to have very strong tempers. Children identified by both teachers and parent response indicators seemed to have far more developmental health problems than children not so identified.

Tables 34 and 35 present home behaviors and health histories for children identified by teacher recommendations, medical risk factors, both, and neither. The doubly identified group (teacher recommendation and medical risk factors) were more often reported by parents to have difficulties indicating social problems and traits which might have an adverse affect on school performance. That is, far more of these children were rated as having not attended nursery school or kindergarten (62%), as learning more slowly than other children (69%), as having trouble reading or doing fine work (23%), having only a few friends (75%), having difficulty getting along with other children (40%), and having a very strong temper (35%). Unlike the findings in the school behavior table, the group of children identified only by the teacher recommendation did not

Table 32*

HOME BEHAVIOR PROFILES OF CHILDREN RECOMMENDED BY TEACHERS AS NEEDING RESOURCES FOR THE MENTALLY RETARDED, CHILDREN IDENTIFIED BY PARENT RESPONSES, CHILDREN IDENTIFIED BY BOTH TEACHERS AND PARENT RESPONSES AND CHILDREN IDENTIFIED BY NEITHER

	Neither Teacher nor Parent Responses	Teacher Only	Parent Responses Only	Both Teacher and Parent Responses
Number (in hundred thousands)	221.9	2.3	2.1	.5
Mean EFSIQ (Standard Error)	96.6 (.6)	79.6 (2.1)	84.4 (2.9)	66.0 (3.0)
Home Behavior Variables† (Rated by Parent, %)				
Did not attend kindergarten or nursery school	30.4	41.2	44.2	46.1
Has trouble reading or doing fine work	4.3	10.3	5.4	-‡
Has only a few friends	37.0	53.2	55.9	61.6
Has difficulty getting along with other children	4.0	12.0	19.9	18.4
Is rather high-strung, tense and nervous	16.9	33.8	28.4	41.9
Has very strong temper, loses it easily	17.1	16.8	31.0	28.1
A foreign language is spoken in the home	10.5	5.4	6.2	4.1

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[*] Standard errors were not generated for these data.

[†] Variables used to establish parent indicators have not been used for comparison in this table.

[‡] No observations in category.

Table 33[*]

DEVELOPMENTAL PROFILES OF CHILDREN RECOMMENDED BY TEACHERS AS NEEDING RESOURCES FOR THE MENTALLY RETARDED, CHILDREN IDENTIFIED BY PARENT RESPONSES, CHILDREN IDENTIFIED BY BOTH TEACHERS AND PARENT RESPONSES, AND CHILDREN IDENTIFIED BY NEITHER

	Neither Teacher nor Parent Responses	Teacher Only	Parent Responses Only	Both Teacher and Parent Responses
Number (hundred thousands)	221.9	2.3	2.1	.5
Mean EFSIQ	96.6	79.6	84.4	66.0
(Standard error)	(.6)	(2.1)	(2.9)	(3.0)
Health/Developmental Variables[†] (Rated by Parent, %)				
Birth injury noted	.4	-[‡]	-	-
Weight under 5 lbs. at birth	2.7	4.3	9.7	27.0
Weight over 10 lbs. at birth	1.2	1.4	-	9.3
Poor health at age 1 year	1.5	7.6	8.4	18.6
Has been knocked unconscious	3.3	10.0	4.1	9.9
Has had a convulsion	3.0	12.6	5.6	19.2
Has trouble hearing	4.2	6.3	8.5	4.2

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[*] Standard errors not generated on these data.

[†] Variables used to establish parent indicators have not been used for comparison in this table.

[‡] No observations in category.

Table 34[*]

HOME BEHAVIOR PROFILES OF CHILDREN RECOMMENDED BY TEACHERS TO RECEIVE RESOURCES FOR THE MENTALLY RETARDED, CHILDREN IDENTIFIED BY MEDICAL RISK FACTORS, CHILDREN IDENTIFIED BY BOTH TEACHERS AND MEDICAL RISK FACTORS, AND CHILDREN IDENTIFIED BY NEITHER

	Neither Teacher nor Medical Risk Factors	Teacher Only	Medical Risk Factors Only	Both Teacher and Medical Risk Factors
Number (hundred thousands)	223.4	2.4	.6	.4
Mean EFSIQ (Standard Error)	96.5 (.6)	78.1 (2.0)	97.4 (3.0)	70.4 (5.2)
Home Behavior Variables (Rated by Parent, %)				
Learning speed slower than other children	3.5	30.0	9.4	69.4
Did not attend kindergarten or nursery school	30.6	39.3	16.8	61.9
Has trouble reading or doing fine work	4.3	6.4	4.9	23.2
Has only a few friends	37.2	52.1	36.6	74.8
Has difficulty getting along with other children	4.2	9.5	-[†]	39.5
Is rather high-strung, tense and nervous	17.1	35.9	13.4	32.6
Has very strong temper, loses it easily	17.2	16.5	21.2	34.7
A foreign language is spoken in the home	10.5	3.4	8.7	15.7

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[*] Standard errors not generated for these data.

[†] No observations in category.

Table 35[*]

DEVELOPMENTAL PROFILES OF CHILDREN RECOMMENDED BY TEACHERS TO RECEIVE RESOURCES FOR THE MENTALLY RETARDED, CHILDREN IDENTIFIED BY MEDICAL RISK FACTORS, CHILDREN IDENTIFIED BY BOTH TEACHERS AND MEDICAL RISK FACTORS, AND CHILDREN IDENTIFIED BY NEITHER

	Neither Teacher nor Medical Risk Factors	Teacher Only	Medical Risk Factors Only	Both Teacher and Medical Risk Factors
Number (hundred thousands)	223.4	2.4	.6	.4
Mean EFSIQ	96.5	78.1	97.4	70.4
(Standard Error)	(.6)	(2.0)	(3.0)	(5.2)
Health/Developmental Variables (Rated by Parent, %)				
Birth injury noted	.4	-[†]	-	-
Weight under 5 lbs. at birth	2.8	7.6	2.8	15.9
Weight over 10 lbs. at birth	1.2	3.5	6.1	-
Poor health at age 1	1.5	9.4	5.5	12.1
First walked after 1.5 years	3.2	15.8	16.3	45.1
Spoke first real word after 1.5 years	8.8	26.9	20.7	37.6
Has been knocked unconscious	3.3	9.4	10.3	13.7
Has had a convulsion	3.0	15.0	12.0	6.6
Has trouble hearing	4.2	4.1	4.4	16.7

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[*] Standard errors not generated for these data.

[†] No observations in category.

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appear to have behavior patterns different from children not identified by either indicator. The only exceptions are that those identified only by the teacher were reported by parents to have only a few friends (52%), to be rather high-strung (36%), and to have a learning speed slower than other children their age (30%).

With regard to developmental characteristics, children doubly identified by both teacher and medical risk factors were again reported to have had many more health and developmental problems than those not identified by either indicator. It should also be noted that children identified only by the teacher or only by medical risk factors were reported to have been slower to walk and talk than most children at a rate at least twice that of children not identified. For the doubly identified group, the rate was at least four times greater.

Achievement Test Scores

Table 36 compares mean achievement and mean EFSIQ scores of children identified by various sets of indicators as being potential candidates for services for the mentally retarded. Note that children identified by teacher recommendation and one other indicator set had significantly lower mean WRAT scores and mean EFSIQ scores than any other groups of children.

It may also be worth pointing out a consistent pattern for children identified only by teacher recommendation for classes for the mentally retarded: these children had lower mean scores on the WRAT achievement tests than children identified only by low EFSIQ, only by parent response, or only by medical risk factors, although the scores were not as low as those where the teacher recommendation was associated with identification from a second set of indicators. However, differences in these scores are not statistically significant. While it is not possible to conclude from these findings that teachers have identified children who are mentally retarded, it is possible to say that teachers appeared to consistently identify children performing significantly below the average, indicating a possible need for some type of special attention.

Table 36*

MEAN SCORES ON ACHIEVEMENT TESTS AND MEAN EFSIQ SCORES OF CHILDREN IDENTIFIED AS POTENTIAL CANDIDATES FOR SERVICES FOR THE MENTALLY RETARDED AND CHILDREN NOT SO IDENTIFIED

	Group Mean WRAT Scores (Mean=50 on both)		Group Mean EFSIQ (Mean=100)	Number (in hundred thousands)
	Reading	Math		
Teacher Recommendation or EFSIQ				
Not identified	50.8 (.3)†	50.8 (.4)	97.0 (.6)	220.8
Teacher recommendation but not low EFSIQ	34.3 (1.1)	34.0 (1.1)	82.3 (1.6)	2.1
Low EFSIQ but not teacher recommendation	36.4 (1.5)	35.7 (1.5)	66.2 (.4)	3.2
Teacher recommendation and low EFSIQ	27.2 (1.06)	24.5 (1.11)	61.5 (1.05)	.7
Teacher Recommendation or Parent Responses				
Not identified	50.7 (.3)	50.6 (.5)	96.6 (.6)	221.9
Teacher Recommendation but not parent responses	33.3 (1.1)	32.8 (1.2)	79.6 (2.1)	2.3
Parent responses but no teacher recommendation	41.5 (1.9)	41.5 (2.0)	84.4 (2.9)	2.1
Teacher recommendation and parent responses	28.9 (1.4)	26.7 (1.7)	66.0 (3.0)	.5

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[*] See Appendix C for tests of significance.

[†] Standard errors in parentheses.

Table 36* (Continued)

MEAN SCORES ON ACHIEVEMENT TESTS AND MEAN EFSIQ SCORES OF CHILDREN IDENTIFIED AS POTENTIAL CANDIDATES FOR SERVICES FOR THE MENTALLY RETARDED AND CHILDREN NOT SO IDENTIFIED

	Group Mean WRAT Scores (Mean=50 on both)		Group Mean EFSIQ (Mean=100)	Number (in hundred thousands)
	Reading	Math		
Teacher Recommendation or Medical Risk Factors				
Not identified	50.6 (.3)†	50.6 (.5)	96.5 (.6)	223.4
Teacher recommendation but not medical risk factors	32.9 (1.0)	32.1 (1.2)	78.1 (2.0)	2.4
Medical risk factors but not teacher recommendation	45.5 (2.7)	47.1 (2.6)	97.4 (3.0)	.6
Teacher recommendation and medical risk factors	29.9 (2.8)	28.3 (3.5)	70.4 (5.2)	.4

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[*] See Appendix C for tests of significance.

[†] Standard errors in parentheses.

Socioeconomic Status and Demographic Characteristics

Table 37 sets out the distribution across socioeconomic status and demographic characteristics for each group of students identified by each set of indicators. Note that in each group except that identified by medical risk factors, Blacks were identified at significantly higher rates than were Whites. Note also that Blacks were selected at a rate of 6.12% when EFSIQ was considered, but at a rate of only 3.28% when teacher recommendations were considered. Other research supports the differential rates found here for Whites and Blacks identified on the basis of IQ scores.* Although the differences reported in Table 37 between Whites (which includes "Other") and Blacks were less using the teacher and parent indicators than using EFSIQ, they were still significant. However, it should be noted that some researchers have found other indicators, such as measures of adaptive behavior, that show little differences between ethnic groups (Mercer, 1973). We suggest some caution in drawing conclusions about the causality for differences in estimated rates based on different indicators in these data, particularly those found for Black children identified by the teacher and those identified by EFSIQ.

While the data indicate that the IQ test identifies Black children at a substantially higher rate than do recommendations by teachers, the magnitude of the difference may not be statistically significant. First, the standard errors of the rates for Black children are rather large, suggesting a large variation in the possible range of the estimates. Second, and perhaps of greater importance is the fact that the children identified by the teacher recommendations and those identified by the EFSIQ scores are, as illustrated in Figure 11(c), almost totally different populations (i.e., the overlap between these two groups was very small),

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*See Conley's study of mental retardation which concluded that "nonwhites are six to seven times more likely to have IQs below 70 than whites" (Conley, 1973, pp. 6-49) and also Jane Mercer's research which found similar discrepancies between white and nonwhite IQ scores (Mercer, 1973, p. 189).

Table 37[*]

SOCIOECONOMIC AND DEMOGRAPHIC CHARACTERISTICS OF CHILDREN IDENTIFIED AS POSSIBLE CANDIDATES FOR SPECIAL SERVICES FOR THE MENTALLY RETARDED

Characteristics	Number of Children in the U.S.[†]	Percent Identified by Various Indicator Sets (Standard Error)			
		Teacher Recommendation for MR Services[‡]	Parent Responses[‡]	Medical Risk Factors[‡]	EFSIQ at 69 or Below[‡]
Total	227	1.23% (.18)	1.15% (.15)	0.44% (.07)	1.72% (.40)
Race					
Black	31	3.28 (.65)	2.57 (.72)	--[††]	6.12 (1.87)
White (includes "Other")	196	0.91 (.16)	0.93 (.11)	0.51 (.09)	1.03 (.22)
Sex					
Male	115	1.73 (.33)	1.36 (.16)	0.42 (.10)	1.55 (.43)
Female	111	0.72 (.16)	0.93 (.20)	0.45 (.11)	1.91 (.42)
Family Income					
Less than $3,000	40	2.19 (.55)	1.88 (.67)	0.25[§] (.18)	6.46 (1.80)
$3,000 to $4,999	40	2.14 (.71)	1.44 (.33)	0.47 (.22)	1.42 (.32)
$5,000 to $6,999	51	1.16 (.15)	1.23 (.26)	0.41 (.14)	0.87 (.20)
$7,000 to $9,999	47	0.74 (.19)	0.71 (.20)	0.32 (.14)	0.15[§] (.11)
$10,000 to $14,999	27	0.27[§] (.18)	0.73 (.35)	0.67 (.28)	0.14[§] (.14)
$15,000 and over	11	0.38[§] (.37)	1.11 (.33)	0.33[§] (.33)	--
Don't know/no response	11	--[**]	--	1.18 (.79)	1.56 (1.04)
Age					
6-7	76	0.63 (.18)	1.23 (.27)	0.38 (.13)	0.99 (.33)
8-9	77	1.38 (.27)	1.04 (.91)	0.42 (.12)	1.45 (.56)
10-11	74	1.71 (.33)	1.18 (.28)	0.51 (.19)	[illegible].77 (.47)
Region					
Northeast	51	1.13 (.34)	1.37 (.23)	0.65 (.16)	0.69 (.27)
Midwest	65	1.02 (.33)	0.63 (.18)	0.40 (.09)	0.69 (.18)
South	54	1.43 (.43)	1.55 (.49)	0.13 (.09)	4.73 (1.58)
West	56	1.39 (.48)	1.17 (.12)	0.58 (.28)	0.96 (.40)
Type of place					
Rural	76	1.25 (.32)	1.09 (.30)	0.34 (.10)	2.97 (.88)
Urban, under 50,000 people	34	1.49 (.51)	1.48 (.34)	0.52 (.24)	1.71 (.70)
50,000 -250,000 people	17	1.75 (.70)	0.51[§] (.21)	0.13[§] (.15)	1.74 (.73)
250,000-3 million people	57	1.15 (.26)	1.28 (.18)	0.46 (.12)	0.64 (.23)
Over 3 million	43	0.90 (.23)	1.08 (.24)	0.63 (29)	0.94 (.24)

[*] See Appendix C for tests of significance.

[†] In hundred thousands.

[‡] Includes all children so identified, whether or not those children were also identified by another set of indicators

[§] Sample too small to permit drawing valid conclusions.

[**] No observations in category.

[††] No Black children in the NCHS sample were identified by selected medical risk factors. Given the fact that the incidence of these conditions is extremely small, this is not particularly surprising. Since Blacks represent a relatively small proportion of the total school population, it is likely that there were not enough Black children in the sample for these conditions to be found.

indicating qualitative as well as quantitative differences in identification factors.

Males are also identified at a significantly higher rate than females for those selected by both teacher recommendation and parent responses, but not for medical risk factors and EFSIQ.

When family income is considered, children from families with an income of less than $3,000 are selected by the EFSIQ scores at a rate of 6.46%, the highest rate in the entire table and a rate very close to that for Black children. The remaining rates of identification decline with income until the income level of $15,000 and over is reached (see Figure 14). Patterns of identification across income categories for each indicator are summarized in Figure 14. For all indicators, children from low-income groups were identified at higher rates than were children from higher-income families, however, these differences were not statistically significant for teacher recommendations and the EFSIQ since sample size in the higher income groups was too small to permit generalization.

In terms of age, the percentage of those selected increases with increasing age for all indicators except parent responses, and is especially pronounced for the EFSIQ-selected group. In terms of region of the country, the only significantly different number is in the South, where children were identified by an EFSIQ of 69 or below at a rate of 4.73%. Finally, in terms of type of place where the child lives, the group with an EFSIQ of 69 or below shows the highest rate of 2.9% in rural places, with lesser percentages in all urban areas.

Given the differences in identification patterns found across socioeconomic factors, it is of some interest to explore whether or not these patterns persist in the group of children who actually were receiving services at the time of the survey. Table 38 shows the rates for children identified by teachers as needing special resources, and the distribution of those rates across availability of resources by socioeconomic status and demographic variables. It should be noted that in distributing the sample across so many variables, the actual number of children who fall into a single group is sometimes quite small and therefore it was

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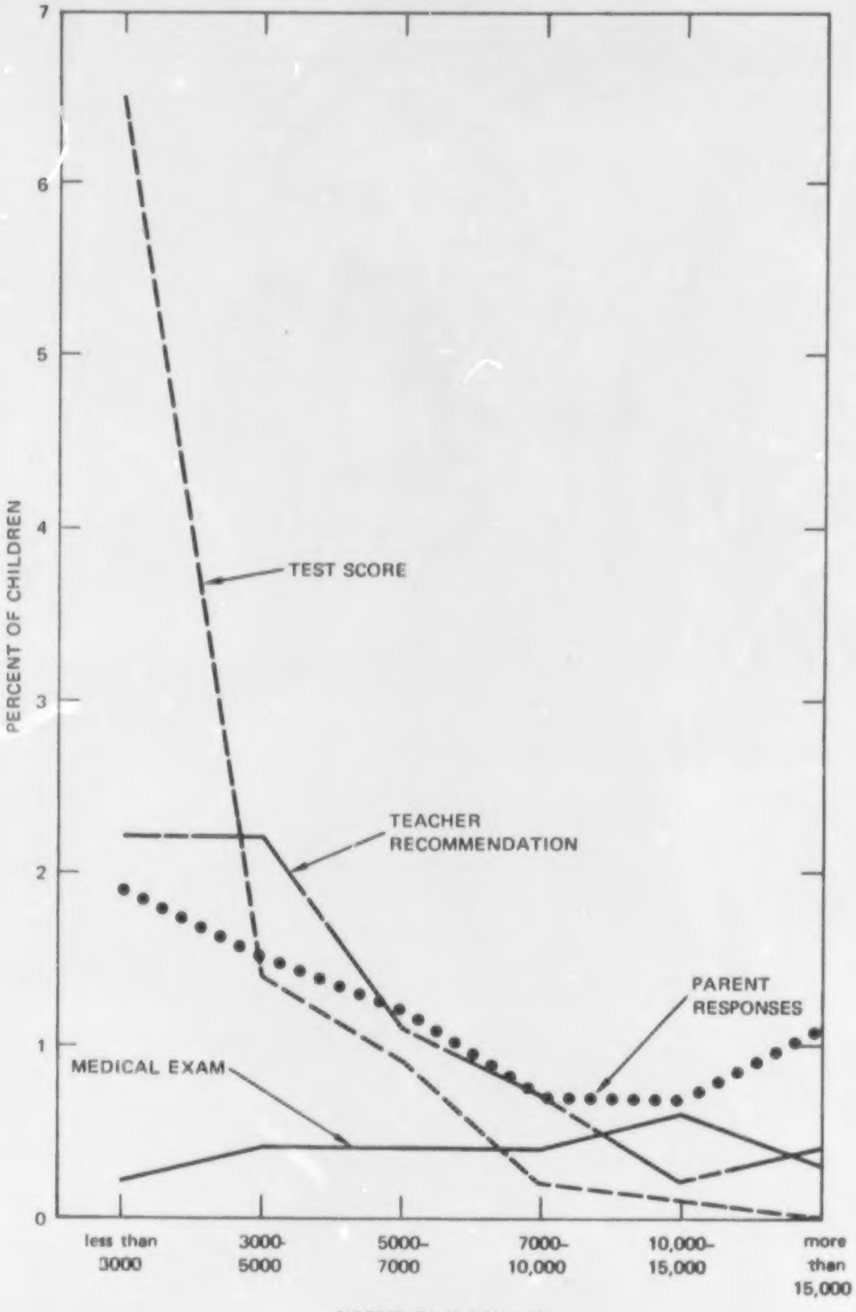

FIGURE 14 ESTIMATED RATES OF IDENTIFICATION OF CHILDREN FOR CLASSES FOR THE MENTALLY RETARDED, BY FAMILY INCOME

Table 38[*]

SOCIOECONOMIC AND DEMOGRAPHIC STATUS, CHILDREN USING AND NOT USING SPECIAL RESOURCES FOR THE MENTALLY RETARDED WHO WERE RECOMMENDED FOR SUCH RESOURCES BY THE TEACHER

	Percent				Number (in thousands)			
	Total Group Recommended by Teacher[†]	Resources Used	Available Not Used	Resources Not Available	Total Group Recommended by Teacher[†]	Resources Used	Available Not Used	Resources Not Available
Total	1.2%	.8%	.2%	.2%	279.7	182.8	44.1	45.0
Sex								
Male	1.7	1.2	.3	.3	199.5	133.5	33.2	29.0
Female	.7	.4	.1	.1	80.4	49.4	10.9	16.0
Race								
Black	3.2	2.0	.3	.8	102.0	62.0	10.6	25.6
White	.9	.6	.2	.1	177.8	120.8	33.5	19.4
Income								
Under $3,000	2.0	1.0	.4	.6	88.7	42.3	17.8	24.5
$3,000-$4,999	2.2	1.6	.4	.2	86.0	62.9	14.3	8.8
$5,000-$6,999	1.0	.8	.0[‡]	.2	59.1	41.5	2.1	11.7
$7,000-$9,999	.7	.6	.1	-[§]	34.4	28.1	6.3	-
$10,000-$14,999	.2	.1	.1	-	7.5	4.0	3.5	-
Over $15,000	.4	.4	-	-	4.1	4.1	-	-
Age								
6-7	.7	.3	.2	.2	48.3	22.3	14.2	11.8
8-9	1.3	.9	.2	.2	105.9	69.1	18.9	17.9
10-11	1.5	1.2	.1	.2	125.5	91.4	11.0	15.3
Region								
Northeast	1.1	.7	.3	.1	59.3	34.5	15.6	5.4
Midwest	1.0	.9	-	.1	66.6	60.0	-	6.6
South	1.3	.5	.3	.5	77.3	26.2	17.8	29.2
West	1.4	1.1	.2	.1	77.7	63.2	10.6	3.9
Type of Place								
Rural	1.3	.6	.3	.4	95.0	44.7	19.1	27.1
Urban, under 50,000	1.5	1.1	.2	.2	50.6	36.6	6.4	7.6
50,000 to 250,000 people	1.7	1.2	.5	-	29.1	20.3	8.8	-
250,000 to 3 million people	1.1	1.0	.0	.1	66.6	56.8	2.6	7.2
Over 3 million	.9	.6	.2	.1	38.4	24.4	7.1	3.1

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[*] Standard errors not generated for these data.

[†] Total includes children for whom the availability of special resources was not known or may not add due to rounding.

[‡] Less than 1/10 of 1%.

[§] No observations in this category.

not possible to perform valid statistical tests on these data. Nevertheless, these data are of interest since it is still possible to see if any consistent patterns occur.

The patterns shown in Table 38 do appear to reflect the same differences found in Table 37. That is, for children using resources for the mentally retarded, Blacks were receiving services at a far higher rate than were Whites (2% for Blacks compared to 0.6% for Whites); far more boys than girls were in special classes; and there was far greater participation by children in low-income groups and somewhat higher participation by older children. It is particularly interesting to note that although there are no differences of note by region or place of residence in terms of those actually receiving services, there is an indication that fewer resources were available for children in the South, those in rural areas, for Blacks, and for children from low-income families.

Summary and Conclusions of Identification of Children as Possible Candidates for Special Services for the Mentally Retarded

It is important to make clear the kinds of conclusions that might be drawn from these data. For example, it is not possible, on the basis of the NCHS data, to reach a conclusion as to whether or not any one child identified as a potential candidate for a class for the mentally retarded was actually retarded. It is, however, possible to reach some conclusions about the characteristics of children selected by various indicators in this sample. Certainly the findings showing higher rates of identification for Black children than for Whites based on the EFSIQ scores are not surprising. It is worth reminding the reader of the current controversy over use of IQ scores in the identification of children who may need services for the mentally retarded. These issues were discussed in some detail in Exhibit 3 of this section. It is certainly not within the scope of this study to resolve the current controversy. It is the consistent observation of such differences in IQ scores that have led to studies regarding the effects of cultural differences on performance on standardized tests.

Certainly the differences between rates of children based on parent indicators is of interest, but again, it is important to note that this study is descriptive in that we are not testing models or analyzing interactions among variables. Therefore, the findings cannot be interpreted in a manner that attributes observed differences in rates as being due to any single factor whether sex, income, or race. There are undoubtedly many factors that confound the results. For example, all the indicators used to suggest possible need for services in this report rely in some way on an estimate of what is "normal." The test, for example, uses a national reference group while parents and teachers may have relied on a local norm. Thus, if the local population is predominantly poor and from the inner city or a rural area, expectations about performance may be somewhat lower than they would be in a wealthy, suburban population. It has not been possible in this study to separate the effects of low income, health, and developmental factors on achievement, but it is evident from the findings that many children who have been selected by indicators used in this study come from low-income families and have histories of poor health and developmental problems. With these caveats in mind, the following major findings are presented:

- Fewer than 2% of all children were identified by any of the indicator sets as being candidates for special services for the mentally retarded.
- The various indicators agreed only to a relatively slight extent in identifying the same children.
- Children identified by at least two independent sets of indicators had a significantly higher incidence of health and behavior problems as reported by parents and a high rate of school adjustment problems as reported by teachers, and had significantly lower mean scores in WRAT reading and math achievement tests and lower mean EFSIQ scores than did children not identified by any indicator.
- Of all children using resources for the mentally retarded, only 24% had EFSIQ scores of 69 or below (the threshold of retardation under the classification system of the American Association on Mental Deficiency).
- Children identified solely by the teacher's recommendation for special resources for the mentally retarded had mean achievement scores in WRAT reading and math that were well below the mean of those not identified, but had mean EFSIQ scores above the 69-or-below thresholds of mental retardation as used in this report.

- Differences in identification patterns found across socioeconomic factors seem to persist in the group of children who were actually receiving services for the mentally retarded. There was a higher rate of participation for: boys, Blacks, children from low-income families, and older children.

Some patterns are shown across the EFSIQ that are not shown for other indicators to the same extent, which reinforces the possible interaction of qualitative factors. For example, the EFSIQ identified a much higher percentage of students in the South than did teachers or parent responses (4.7%, as opposed to 1.4% and 1.5%, respectively); it identified a much larger percentage of those from families whose income was under $3,000 than did teachers or parent responses (6.5%, as opposed to 2.2% and 1.9%, respectively).

It was pointed out that children identified as possible candidates by both the teacher recommendation and the EFSIQ score tended to differ significantly from other children in several ways. However, it is interesting to note how children identified only by the teacher's recommendation (no mental retardation recognized by EFSIQ) differ from children identified only by low EFSIQ score (no mental retardation recognized by the teacher):

Variable	Children Identified Only By Teacher's Recommendation	EFSIQ of 69 or Below
Specific disciplinary action never required	12.0%	43%
Frequently accused of fighting by other children	23.9	8.1
Did not attend kindergarten or nursery school	33.0	78.7
Is rather high-strung, tense, and nervous	34.4	20.9
A foreign language is spoken in the home	5.8	11.0
Has had a convulsion	13.7	0.9

The analyses of these data and findings regarding the characteristics of children selected or not selected by various indicators suggests the need for careful assessment and caution in the diagnosis of a child as mentally retarded.

Emotional Disturbance

There is little consensus among educators or psychiatrists on an appropriate measurement or criterion that can be used to identify an emotionally disturbed child. Few (if any) reliable instruments have been developed to measure emotionally disturbed behavior. Some research has indicated that other than clinical factors may influence a clinician in classifying individuals as emotionally disturbed (e.g., social class, as indicated by Hollingshead and Redlich, 1958). Nicholas Hobbs, in his three-volume study of issues in the classification of children concluded (Hobbs, p. 57, 1975):

> "Despite the progress . . . , diagnostic classification of cognate conditions in children remain a thicket of thorny problems. The terminology is strongly influenced by factors unrelated to the characteristics of the child. A particular child, for example, may be regarded as mentally ill by a psychiatrist, as emotionally disturbed by a psychologist, and as behavior disordered by a special educator."

There are many types of emotional disturbances and, unlike many other handicapping conditions, the variations of severity and need for special services over time may not always be constant. For example, some children may experience significant short-term emotional disturbances over a divorce of parents, remarriage, or the death or severe illness of a family member or friend. In most cases there is not likely to be any long lasting effects that will incapacitate a child, and the need for special resources may exist for only a few weeks or months. On the other hand, there are children who have deep-rooted emotional problems that may require special educational resources over a long period of their school lives.

It is important to emphasize that the items drawn from the NCHS data base to form indicators of a child's possible candidacy for special services for the emotionally disturbed form only a very crude screen. Neither the parent nor the examining physician was asked directly whether he/she considered a child to be emotionally disturbed. As shown in Table 39, only the teacher was asked in any direct way. Nonetheless, from the parent responses, the consultants selected items that, considered together, suggest a probability or risk of possible emotional disturbance. It is possible that this indicator set may exclude some children in this sample who actually are emotionally disturbed and may include others who, despite unusual behavior, are not. For example, the frequent occurrence of thumb sucking and bed wetting in a six year old is probably not as significant in considering the possible existence of an emotional problem as it would be for a ten or eleven year old. Considering factors such as this, the consultants suggested that a child must be rated by the parent as having four or more of the traits outlined in Table 39. The medical examination risk factors were established by consultants for the same purpose. However, since this indicator set identified only one child out of 6,797, no use has been made of medical results in this report.

The items shown in Table 39 were tabulated, with the result shown in Figure 15. However, as in the case of those identified as possible candidates for services for the mentally retarded, the teacher recommendation tended to identify a different group of children from those identified by parent responses, as shown in Figure 16. Out of each hundred children identified, there was agreement between parent responses and teacher recommendations for only seven children.

Of the children recommended by teachers as candidates for resources for the emotionally disturbed (3.4% of all children), 22% were already using such resources, 23% had such resources available but were not using them, and 55% did not have resources available (see Table 40). Of those children receiving special resources for the emotionally disturbed, 78% were identified by teacher recommendation alone while 22% were identified by both teacher recommendation and by parent responses. Children identified by the teacher as possible candidates for such resources, and for whom resources were available but were not being received, showed a similar pattern: 23% were identified by both teacher recommendation and

Table 39

INDICATORS AND RISK FACTORS USED TO IDENTIFY CHILDREN WHO ARE POSSIBLE CANDIDATES FOR SPECIAL SERVICES FOR THE EMOTIONALLY DISTURBED

Teacher

In response to the question "If the following special resources were available, check those you would recommend for this child," checked "Special provision for emotionally disturbed."

Parent Responses

At least four of the indicated responses to the following items:

"Does the child ever wet the bed"	"Yes, several times a week"
"Does the child at present ever suck his/her thumb or fingers?"	"Yes, almost every day"
"Does he/she have bad (unpleasant dreams or nightmares?"	"Yes, frequently"
"Does he/she walk in his/her sleep?"	"Yes, frequently"
"Has your child ever had a convulsion?"	"Yes"
Number of friends	"Only a few"
Number of times run away from home	Two or more
"Gets along with other children"	"Has difficulty with many"
How tense or relaxed the child is	"Rather high-strung, tense, and nervous" OR "Unusually calm and relaxed"
Child's temper	"Has a very strong temper, loses it easily" OR "Hardly ever gets angry or shows any temper"

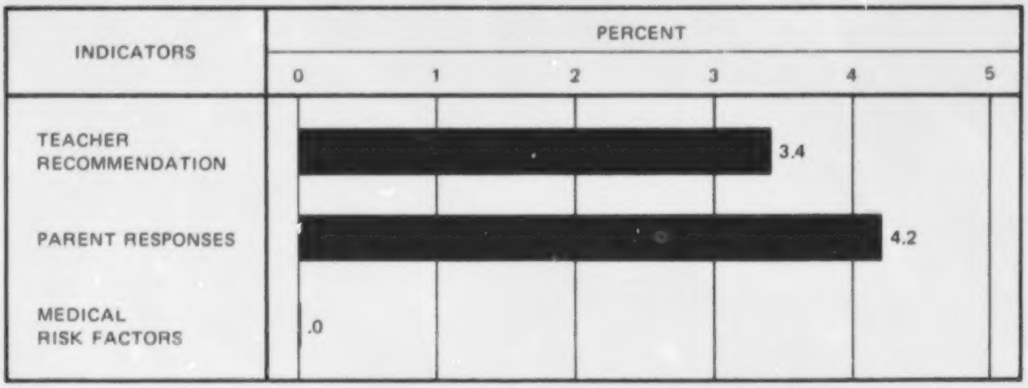
Medical Findings

Finding of minimal celebral dysfunction AND at least two of the following:

"Other congenital abnormalities"	At least one noted
"Tics or mannerisms"	At least one noted
"Pulse rate"	95th percentile or above
Finger sucking or nail biting noted	
"Average systolic blood pressure"	95th percentile or above

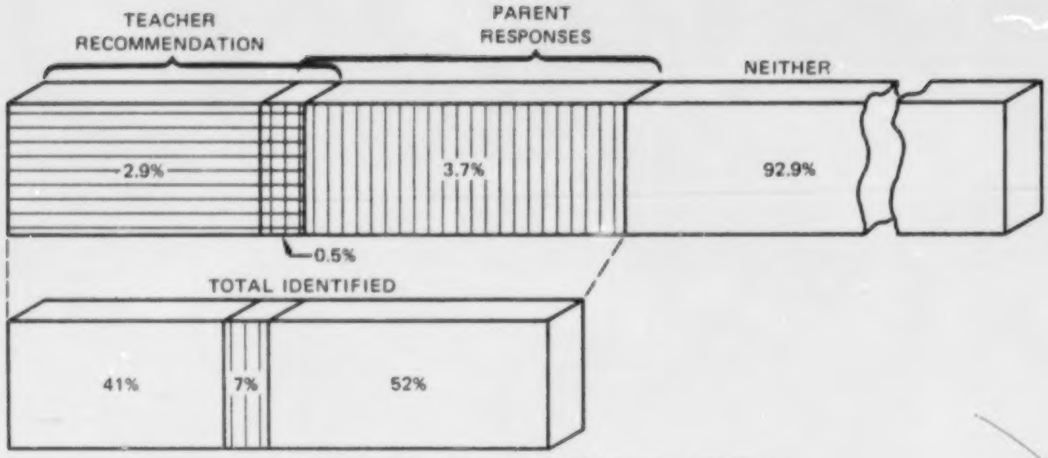
Audiometry test

Conditions affecting test results	Checked "Behavior" and added wording indicating that the child could not follow directions.



*Estimated rates represent the population in school for whom school data were available. Estimated rates for children not in school are presented in Section VII.

FIGURE 15 RATES OF THE POTENTIAL NEED FOR SPECIAL RESOURCES FOR THE EMOTIONALLY DISTURBED USING VARIOUS INDICATORS*



(a) AGREEMENT BETWEEN TEACHER AND PARENT

FIGURE 16 IDENTIFICATION OF CHILDREN WHO MAY NEED SERVICES FOR THE EMOTIONALLY DISTURBED

Table 40

APPLICATION OF INDICATORS TO POPULATION FOR WHOM TEACHER HAD RECOMMENDED SPECIAL RESOURCES FOR THE EMOTIONALLY DISTURBED

Source of Identification	Percent of Total Teacher-Identified Group	Percent of Group Using Special Resources	Percent of Group Not Using Special Resources (Resources Available)	Percent of Group Without Resources Available
Parent Indicators:				
Identified	15%	22%	23%	7%
Not Identified	85	78	77	93
Total	100%	100%	100%	100%

parent response indicators while 77% were identified by the teacher recommendation alone.

School Behavior Profiles

In looking for factors which might account for a child's selection as a possible candidate for special resources for the emotionally disturbed, school behavior profiles were compared for those selected by the teacher recommendation, parent indicator set, both, and neither (Table 41).

Children identified from parent responses as possible candidates for resources for the emotionally disturbed appear to have school behavior profiles much more like children not so identified (either from teacher recommendation or from parent responses) than like children identified by teacher recommendation or children identified both by teacher recommendation and parent responses. Children identified from parent responses only were reported as slightly less attentive and slightly more restless, were reported as much more likely to be frequently accused of fighting by other children, and were reported more often as too "rough" with other children and seemed to require more disciplinary action than children not identified.

Children identified by teacher recommendation or both teacher and parent responses had profiles that were very much alike. These children differed most from children identified by neither indicator (or identified only from parent responses) in their ability to pay attention, the frequency with which disciplinary action was required, and their popularity with their peers. For example, 90% of the children identified by both teacher recommendation and parent responses and 74% of those identified by teacher recommendation were rated as "Amost never chosen as leader in children's play," while only 24% of children not identified and only 27% of children identified only from parent responses were so rated. Teacher ratings of low intellectual ability ("Intellectual ability is clearly below average for age") were 17.6% for children not identified, 27.8% for children identified only from parent responses, 44.1% for children identified only from teacher recommendation, and 55.5% for children identified from teacher recommendation and parent responses.

Table 41[*]

SCHOOL BEHAVIOR PROFILES OF CHILDREN RECOMMENDED BY TEACHERS FOR SPECIAL RESOURCES FOR THE EMOTIONALLY DISTURBED, CHILDREN SELECTED BY PARENT RESPONSES, CHILDREN IDENTIFIED BY BOTH TEACHER AND PARENT, AND CHILDREN IDENTIFIED BY NEITHER

	Neither Teacher Nor Parent Responses	Teacher Only	Parent Responses Only	Both Teacher and Parent Responses
Number (in hundred thousands)	210.8	6.5	8.3	1.1
Mean EFSIQ	96.6	89.9	94.1	90.7
(Standard Error)	(.63)	(.96)	(1.16)	(3.41)
School Profile (Teacher Ratings, %				
Academic Standing				
Repeated a grade	12.6% (1.17)[†]	40.6% (4.31)	19.7% (2.75)	46.7% (10.65)
School Behavior				
Less attentive than most for his/her age	20.1 (.88)	72.9 (3.03)	34.5 (2.19)	83.0 (3.6)
Extremely restless for his/her age (constantly moving)	6.8 (.38)	50.8 (3.22)	11.0 (1.99)	65.0 (7.27)
Frequently accused of fighting by other children	4.9 (.43)	37.3 (3.67)	13.7 (1.93)	49.1 (11.96)
Too "rough" with other children	4.3 (.35)	24.9 (2.93)	8.0 (1.40)	24.4 (7.49)
Frequently injured	2.2 (.22)	12.3 (2.08)	3.4 (1.07)	11.4 (6.63)
Other children's parents complain about his/her behavior	0.5 (.10)	7.4 (1.59)	1.3 (.71)	13.0 (8.51)

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[*] See Appendix C for tests of significance.

[†] Standard errors shown in parentheses.

Table 41* (Continued)

SCHOOL BEHAVIOR PROFILES OF CHILDREN RECOMMENDED BY TEACHERS FOR SPECIAL RESOURCES FOR THE EMOTIONALLY DISTURBED, CHILDREN SELECTED BY PARENT RESPONSES, CHILDREN IDENTIFIED BY BOTH TEACHER AND PARENT, AND CHILDREN IDENTIFIED BY NEITHER

	Neither Teacher Nor Parent Responses	Teacher Only	Parent Responses Only	Both Teacher and Parent Responses
School Behavior (Continued)				
Discipline doesn't work	0.9 (.14)†	15.4 (2.38)	2.1 (.87)	32.7 (9.36)
Specific disciplinary action frequently required	6.0 (.39)	43.0 (3.55)	12.9 (2.61)	63.1 (8.38)
Almost always chosen last in children's play	11.1 (.56)	43.7 (3.89)	11.6 (2.12)	41.7 (13.84)
Almost never chosen as leader in children's play	24.1 (.64)	74.0 (3.35)	27.2 (2.90)	90.9 (7.14)
Intellectual Ability				
Intellectual ability is clearly below average (bottom 25%) for age	17.6 (.68)	44.1 (2.34)	27.8 (2.71)	55.5 (10.17)

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*See Appendix C for tests of significance.

†Standard errors shown in parentheses.

Health, Development, and Home Behaviors

Children identified from parent responses and teacher recommendations as possible candidates for special resources for the emotionally disturbed show considerable differences in health and development (Table 42) and in home behaviors (Table 43) from children identified by neither source. For those identified by parent responses or teacher recommendation and parent responses, a higher percentage weighed less than 5 lb at birth (6.6% and 4.3% as opposed to 2.8%), did not speak the first real word until after 1.5 years of age (17.5% and 14.6% as opposed to 8.8%), and had been knocked unconscious more frequently than other children (10.7% and 6.5% compared to 3.3%). For the group of children identified by either or both indicators, all were reported to have been somewhat slower in walking (teacher-identified, 6.1%; parent-response-identified, 6.4%; both, 7.1% as opposed to 3.2% for children identified by neither source) and being slower to learn than other children (teacher-identified, 6.0%; parent-response-identified, 10.3%; both, 23.6% compared with only 3.5% of children not identified by any source).

Achievement

The children who were not identified as possible candidates for special resources for the emotionally disturbed showed significantly higher mean WRAT scores on both reading and math and higher mean EFSIQ scores than any of the groups of children identified as possible candidates for services for the emotionally disturbed (Table 44).

Socioeconomic and Demographic Patterns

Significant differences were found across race, sex, age, and income between children recommended by teachers for services for the emotionally disturbed and children not so recommended (Table 45). Teachers identified far more Blacks than Whites, twice as many boys as girls, fewer 6- and 7-year-olds than older children, and more children from lower income than from higher income families. The pattern of identification across income groups is illustrated in Figure 17.

Table 42*

DEVELOPMENTAL PROFILES OF CHILDREN RECOMMENDED BY TEACHERS AS NEEDING RESOURCES FOR THE EMOTIONALLY DISTURBED, CHILDREN SELECTED BY PARENT RESPONSES, CHILDREN IDENTIFIED BY BOTH TEACHERS AND PARENTS AND CHILDREN IDENTIFIED BY NEITHER

	Neither Teacher nor EFSIQ	Teacher Only	Parent Responses Only	Both Teacher and Parent Responses
Number (in hundred thousands)	210.8	6.5	8.3	1.1
Mean EFSIQ (Standard Error)	96.6 (.63)	89.9 (.96)	94.1 (1.16)	90.7 (3.41)
Health/Developmental Variables[†] (Parent Ratings, %)				
Birth injury noted	.4%	--[‡]	--	--
Weight under 5 lbs. at birth	2.8	2.2%	4.3%	6.6%
Weight over 10 lbs. at birth	1.2	1.6	1.0	--
Poor health at age 1	1.5	1.7	4.9	--
First walked after 1.5 years	3.2	6.1	6.4	7.1
Spoke first real word after 1.5 years	8.8	7.8	14.6	17.5
Has been knocked unconscious	3.3	3.3	6.5	10.2
Has trouble hearing	3.9	8.1	10.7	--

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[*] Standard errors not generated for these data.

[†] Variables used to establish parent indicators have not been used for comparison in this table.

[‡] No observations in category.

Table 43[*]

HOME BEHAVIOR PROFILES OF CHILDREN RECOMMENDED BY TEACHERS AS NEEDING RESOURCES FOR THE EMOTIONALLY DISTURBED, CHILDREN SELECTED BY PARENT RESPONSES, CHILDREN IDENTIFIED BY BOTH TEACHERS AND PARENTS AND CHILDREN IDENTIFIED BY NEITHER

	Neither Teacher nor Parent	Teacher Only	Parent Responses Only	Both Teacher and Parent Responses
Number (in hundred thousands)	210.8	6.5	8.3	1.1
Mean EFSIQ	96.6	89.9	94.1	90.7
(Standard Error)	(.63)	(.96)	(1.16)	(3.41)
Home Behavior Variables[†] (Parent Ratings, %)				
Learning speed slower than other children	3.5%	6.0%	10.3%	23.6%
Did not attend kindergarten or nursery school	30.2	40.7	32.5	42.3
Has trouble reading or doing fine work	4.1	6.7	9.2	--[‡]
A foreign language is spoken in the home	10.7	5.3	9.2	--

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[*] Standard errors not generated for these data.

[†] Variables used to establish parent indicators have not been used for comparison in this table.

[‡] No observations in category.

Table 44[*]

MEAN SCORES ON ACHIEVEMENT TESTS AND MEAN EFSIQ SCORES OF CHILDREN IDENTIFIED AS POTENTIAL CANDIDATES FOR SERVICES FOR THE EMOTIONALLY DISTURBED AND CHILDREN NOT SO IDENTIFIED

	Group Mean WRAT Scores (Mean=50 on both)		Group Mean EFSIQ (Mean=100)	Number (in hundred thousands)
	Reading	Math		
Teacher Recommendation or Parent Responses				
Not Identified	50.7 (.32)[†]	50.6 (.47)	96.6 (.63)	210.8
Teacher recommendation but not parent responses	44.8 (.78)	44.3 (.59)	89.9 (.96)	6.5
Parent responses but not teacher recommendation	48.3 (.84)	47.7 (.78)	94.1 (1.16)	8.3
Teacher recommendation and parent responses	43.8 (3.07)	44.2 (2.73)	90.7 (3.41)	1.1

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[*] See Appendix C for tests of significance.

[†] Standard errors in parentheses.

Table 45*

SOCIOECONOMIC AND DEMOGRAPHIC CHARACTERISTICS OF CHILDREN IDENTIFIED AS POSSIBLE CANDIDATES FOR SERVICES FOR THE EMOTIONALLY DISTURBED

Characteristic	Number of Children in the U.S.†	Percent Identified by Various Indicator Sets (Standard Error)	
		Teacher Recommendation for Emotionally Disturbed Services‡	Parent Responses‡
Total	227	3.37% (.32)	4.18% (.23)
Race			
Black	31	5.09 (.59)	4.98 (.76)
White (includes "Other")	196	3.09 (.36)	4.05 (.24)
Sex			
Male	115	4.44 (.53)	4.59 (.34)
Female	111	2.25 (.30)	3.75 (.28)
Income			
Less than $3,000	40	4.83 (.78)	5.78 (.80)
$3,000 to $4,999	40	4.28 (.68)	4.61 (.58)
$5,000 to $6,999	51	3.08 (.65)	3.91 (.50)
$7,000 to $9,999	47	2.79 (.54)	4.22 (.71)
$10,000 to $14,999	27	2.28 (.49)	3.36 (.78)
$15,000 and over	11	2.62 (1.19)	2.24 (.68)
Don't know/no response	11	1.84 (.69)	1.71 (.62)
Age			
6-7	76	2.29 (.33)	4.84 (.34)
8-9	77	3.96 (.57)	4.26 (.51)
10-11	74	3.86 (.40)	3.40 (.34)
Region			
Northeast	51	2.61 (.43)	4.05 (.29)
Midwest	65	3.04 (.43)	4.85 (.53)
South	54	4.00 (.63)	3.62 (.55)
West	56	3.84 (.75)	4.05 (.70)
Type of Place			
Rural	76	3.58 (.41)	4.88 (.57)
Urban, under 50,000 people	34	3.58 (.96)	3.20 (.54)
50,000-250,000 people	17	2.09 (1.18)	4.24 (.69)
250,000-3 million people	57	3.70 (.76)	3.82 (.56)
Over 3 million people	43	2.86 (.38)	4.18 (.50)

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*See Appendix C for tests of significance.

†In hundred thousands.

‡Includes all children so identified, whether or not those children were also identified by another set of indicators.

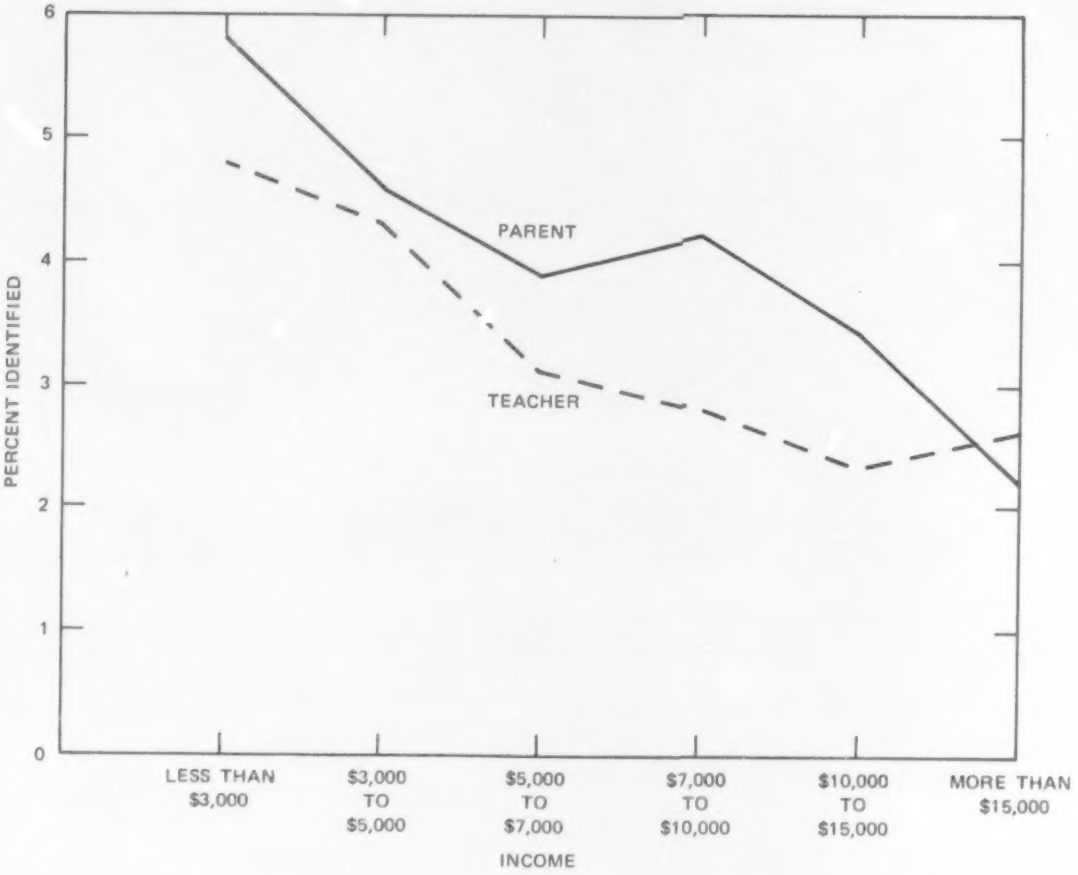

FIGURE 17 RATES OF IDENTIFICATION OF CHILDREN IDENTIFIED BY TEACHER RECOMMENDATION AND BY PARENT RESPONSES AS POSSIBLY EMOTIONALLY DISTURBED ACROSS INCOME CATEGORIES

It is interesting to note in Figure 17 that even though the absolute rates of identification based on teacher recommendations and parent responses are different, there is, nevertheless, a consistent pattern of decreasing rates across income groups.*

Table 46 shows participation and nonparticipation in special resources for the emotionally disturbed across socioeconomic and demographic variables. A few patterns across these variables are found which are consistent with those found for parent indicators and teachers recommendations--Black students and boys appear to be receiving services at a higher rate than White students and girls. On the other hand, students from low-income families appear to have fewer services available to them compared with the rates at which they are recommended and there also appear to be fewer services available for students living in the South and in rural areas.

Summary and Conclusions for Children Who May Need Services for the Emotionally Disturbed

Numerous types of variables were compared for children identified as possible candidates for services for the emotionally disturbed by teachers, children identified from parent responses, children identified both from teacher recommendations and parent responses and those not identified by either source. The medical risk factors, which identified only a single child in the entire NCHS survey, were not used in making comparisons.

Findings are as follows:

- The overlap between children recommended for special resources for the emotionally disturbed by teachers and those identified as possible candidates for such services from parent responses, using sets of items commonly associated with emotional disturbance, was very small; only 7 out of every 100 children were identified.

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*The peak in the parent response rates shown for the income category of $7,000 to 10,000 does not negate the overall pattern of decreasing rates for these indicators.

Table 46*

SOCIOECONOMIC AND DEMOGRAPHIC STATUS, CHILDREN USING AND NOT USING SPECIAL RESOURCES FOR THE EMOTIONALLY DISTURBED WHO WERE RECOMMENDED FOR SUCH RESOURCES BY THE TEACHER

	Percent				Number (in thousands)			
	Total Group Recommended by Teacher†	Resources Used	Resources Available Not Used	Resources Not Available	Total Group Recommended by Teacher†	Resources Used	Resources Available Not Used	Resources Not Available
Total	3.4%	.7%	.8%	1.4%	763.6	169.6	173.0	312.9
Sex								
Male	4.4	1.0	1.1	1.7	432.3	118.2	121.3	192.8
Female	2.3	.5	.5	1.1	223.1	51.4	51.6	120.2
Race								
Black	5.1	1.3	.9	2.1	158.3	41.8	27.5	65.8
White	3.1	.7	.7	1.3	605.4	127.7	145.4	247.1
Income								
Under $3,000	4.8	.5	.7	2.5	195.6	18.6	29.7	102.2
$3,000-$4,999	4.3	1.1	.9	1.8	171.8	42.5	34.5	73.4
$5,000-$6,999	3.1	1.1	.7	.9	156.3	57.9	33.4	47.3
$7,000-$9,999	2.8	.7	.9	1.1	129.8	31.9	44.0	51.3
$10,000-$14,999	2.3	.1	.7	.8	61.8	3.8	19.1	22.7
Over $15,000	2.6	1.0	.5	.9	27.7	10.2	5.8	9.4
Age								
6-7	2.3	.4	.3	1.3	174.8	28.4	21.0	101.1
8-9	4.0	.8	1.1	1.4	304.6	65.3	87.7	107.0
10-11	3.9	1.0	.9	1.4	284.2	75.9	64.3	104.8
Region								
Northeast	2.6	1.0	.3	.9	133.8	48.8	13.2	47.4
Midwest	3.0	.7	.9	1.1	198.1	45.2	59.6	71.4
South	4.0	.4	.8	2.0	216.8	21.8	45.1	107.4
West	3.8	1.0	1.0	1.5	215.0	53.8	55.1	86.7
Area Population								
Rural	3.6	.2	.7	2.0	273.5	18.8	52.4	153.5
Urban, under 50,000	3.6	.9	.8	1.7	121.8	30.6	26.9	58.5
50,000 to 250,000 people	2.1	1.1	.3	.7	34.7	18.1	5.4	11.3
250,000 to 3 million people	3.7	1.1	1.0	.9	211.8	61.5	55.0	51.5
Over 3 million people	2.9	1.0	.8	.9	121.8	40.6	33.2	38.3

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[*] Standard errors not generated for these data.

[†] Total includes children for whom the availability of special resources was not known or may not add due to rounding.

- Of all children receiving special resources for the emotionally disturbed (approximately 0.008% of the total school population), 22% were identified both by teacher recommendation and from parent responses while 78% were identified by teacher recommendations alone.
- Children identified as possible candidates from parent responses alone did not have school behaviors much different from those of children not identified either by teacher recommendation or from parent responses, but they did tend to have more health related problems such as late walking, had been knocked unconscious at some point, and had trouble hearing. On the other hand, children recommended only by teachers for services for the emotionally disturbed tended to be less popular with their school playmates, less attentive, more restless, and require more frequent disciplinary action. They also tended to score significantly lower on achievement tests and to have somewhat lower mean EFSIQ scores, although not low enough to fit the classification of mentally retarded. In addition, a higher percentage of this group were rated by teachers as being intellectually below average.
- Teachers recommended significantly more Black children than White, twice as many boys as girls, fewer 6- and 7-year olds than older children, and significantly more children from lower-income than from higher-income families as possible candidates for services for the emotionally disturbed.
- For children receiving services, there were some patterns consistent with findings from parent responses and teacher recommendations. Boys and Blacks were receiving services at a higher rate than were girls and Whites. Also fewer resources appeared to be available for students in the South, in rural areas, and from low-income families.

The kinds of traits that seem to differentiate children identified by teachers as candidates for special services for the emotionally disturbed are such things as below-average achievement, unpopularity with other children, and the frequent need for discipline. In addition, those identified only by the teacher were also reported more frequently as being "too rough," as being accused of fighting by others, and as being injured more frequently than others. It was also reported more frequently that "discipline doesn't work" for these children.

Finally a consistent parallel pattern was found for children identified by parent responses and by teacher recommendations for services for the emotionally disturbed across income groups--the rates of identification in each case drop with increasing income, suggesting that the kinds of behaviors teachers associate with emotional disturbance and the kinds of behavioral traits commonly associated with emotional disturbances (reflected in parent indicators) may have a strong relationship to socioeconomic and, by implication, environmental factors.

V SPEECH HANDICAPS

Definitions

To aid in comparing rates of identification for possible speech problems based on information in the NCHS sample, data were used from the responses to the parent questionnaire, the teacher evaluation, and the medical examination findings. Consultants selected indicator sets (shown in Table 47) to aid in identifying children who were possible candidates for speech therapy.

On the basis of the above definitions of speech impariments, the overall rates (Figure 18) were found to vary significantly for each indicator set for children in school for whom data were available. Given the basis for these rates, this variation is not surprising since the medical findings selected were linked to specific medical conditions. On the other hand, the parent response indicator set was broad and included children with minor difficulties of types that often disappear with maturity.

Extent of Agreement of Different Indicator Sets

Of the children identified by either teachers or parent responses, there was agreement between the two indicators on only one child out of four. As Figure 19 shows, the agreement between teacher identifications and medical findings was much smaller, and only three out of every hundred children identified were identified by both teacher and medical findings. This is not unexpected since the medical indicators selected from these data identified only the most severe conditions (excluding cerebral palsy). The total population represented by medical indicators is only 0.2%. It should be noted, however, that of those children identified by the medical indicators, teachers also recommended speech therapy for approximately 75%.

Table 47

INDICATORS AND RISK FACTORS USED TO IDENTIFY CHILDREN AS POSSIBLE CANDIDATES FOR SPEECH THERAPY

Teacher

In response to the question "If the following special resources were available, check those you would recommend for this child," checked "Speech therapy."

Parent Responses

In responses to the question "Is there any problem with the way this child talks," checked "Yes."

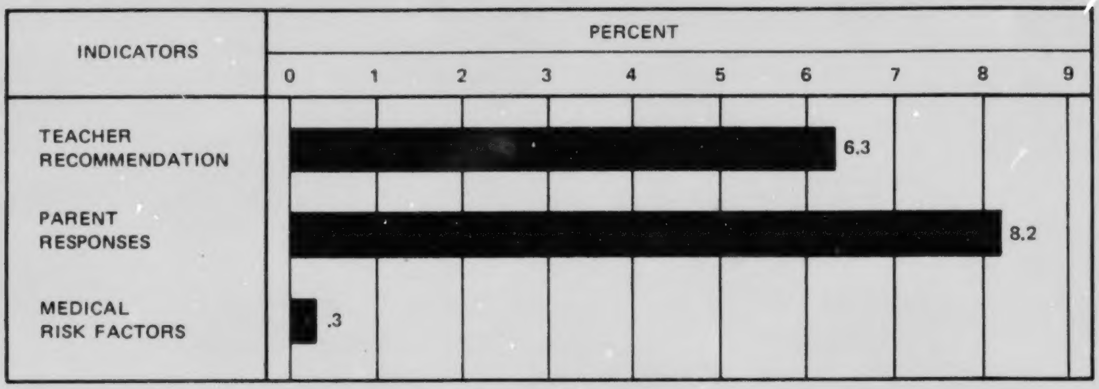
Further, checked one of the following:

- Stammering or stuttering
- Lisping
- Hard to understand
- Something else (and added some descriptor).

Medical Findings

Pediatrician noted either

- Cleft palate, OR
- Ear condition, including deafness.



*Estimated rates represent the population in school for whom school data were available; estimated rates for children not in school are presented in Section VII.

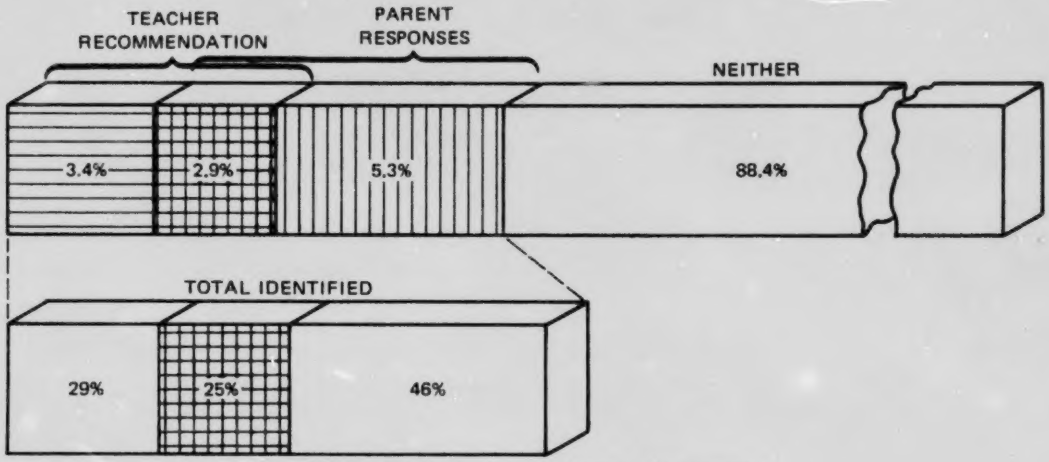
FIGURE 18 RATES OF THE POTENTIAL NEED FOR SPECIAL RESOURCES FOR THE SPEECH HANDICAPPED USING VARIOUS INDICATORS*

In a similar attempt by the National Children's Bureau of London, England, to compare various assessments of handicapping conditions, they too found a very large discrepancy between assessments for speech based on medical, test, parent, and teacher identification factors (Calnan and Richardson, unpublished manuscript, undated) according to Calnan and Richardson,

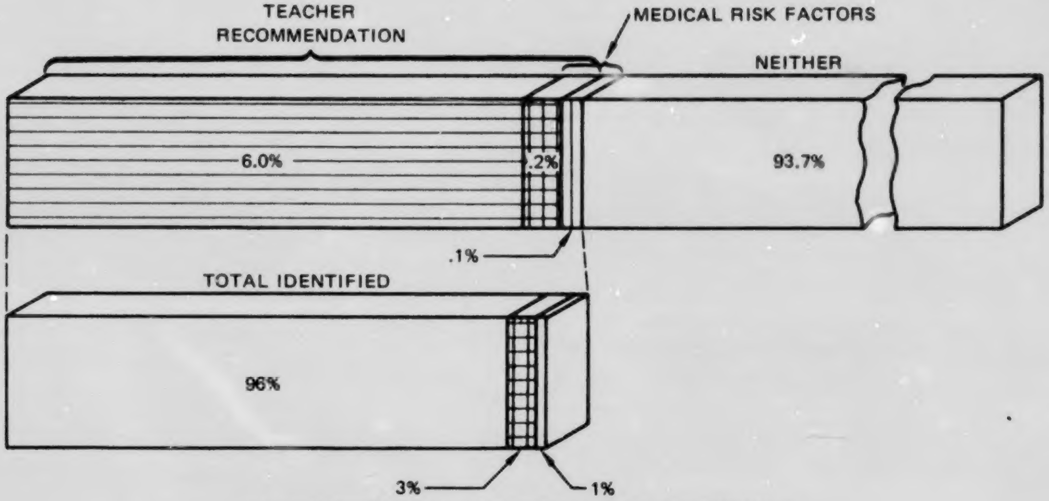
> There proved to be relatively little agreement between the sources of assessment concerning who had or had not a speech problem of some sort. Where a large degree of concurrence would be expected, for example, between 'articulation defect' and teachers 'poor speech,' alleged speech problems according to one source remained unconfirmed, more often than not, according to the other. Even for as prominent a problem as stuttering teachers claimed that over half of those cases so diagnosed by doctors had no poor speech (p. 13).

Availability and Use of Resources

Almost half (47%) of the children for whom teachers recommended speech therapy were receiving such therapy; 19% had resources available but were not using them, and 33% had no speech therapy resources available. Of the group using special resources, only 3% were identified by both medical findings and teacher recommendation, and 57% were identified by both



(a) AGREEMENT BETWEEN TEACHER AND PARENT



(b) AGREEMENT BETWEEN TEACHER AND PEDIATRICIAN

FIGURE 19 IDENTIFICATION OF CHILDREN WHO MAY NEED SERVICES FOR THE SPEECH IMPAIRED

parent responses and teacher recommendation (Table 48). Of the group recommended to receive special resources and for whom such resources were available but not being used, 1% were identified by both teacher and medical findings, and 44% were identified by both teacher and parent responses. Finally, of the group recommended by the teacher for special resources but for whom no resources were available, 6% were identified by both teacher recommendation and parent responses. Of the total group identified by teacher recommendations for speech therapy, 3% were also identified from medical findings, and 46% were identified from parent responses.

Health/Developmental and Behavior Profiles

From Table 49, it is evident that children identified either by teacher recommendation, from parent responses, or both were two to three times as likely to be slower in walking and talking than children not identified by either indicator. A greater percentage of the teacher-and/or parent-identified children also were reported to have had low birth weight, poor health at age 1 year, and trouble hearing.

In terms of home behavior, there are other noticeable differences between children identified either by teacher recommendation, from parent responses, or both, and children not identified as candidates for speech therapy, as shown in Table 50. Doubly identified children were most often scored by their parents as slow in learning (16.6% as compared with 2.9% for children not identified), as having few friends (48.4% as compared with 36.7%), and as being rather high-strung, tense, and nervous (27% as compared with 16.8%). Children identified only by a teacher's recommendation for speech therapy were more likely to come from a home where a foreign language was spoken (13% as compared with 10.5% for children not identified and 6.1% for children doubly identified), and more often had not attended kindergarten or nursery school (33.1%, as compared with 30.6% for children not identified and 29.7% for children doubly identified). Children identified only from parent responses were much more likely to be scored as having a very strong temper and losing it easily (26.4% as compared with 16.6% for children not identified and

Table 48

APPLICATION OF INDICATORS TO POPULATION FOR WHOM TEACHERS HAD RECOMMENDED SPEECH THERAPY

Source of Identification	Percent of Total Teacher-Identified Group	Percent of Group Using Special Resources	Percent of Group Not Using Special Resources (Resources Available)	Percent of Group Without Resources Available
Medical Risk Factors:				
Identified	3%	3%	1%	6%
Not Identified	97	97	99	94
Total	100%	100%	100%	100%
Parent Indicators:				
Identified	46	57	44	34
Not Identified	54	43	56	66
Total	100%	100%	100%	100%

Table 49*

DEVELOPMENTAL PROFILES OF CHILDREN RECOMMENDED BY TEACHERS AS NEEDING SPEECH THERAPY, CHILDREN SELECTED BY PARENT RESPONSES, CHILDREN IDENTIFIED BY BOTH TEACHERS AND PARENTS AND CHILDREN IDENTIFIED BY NEITHER

	Neither Teacher nor Parent	Teacher Only	Parent Responses Only	Both Teacher and Parent Responses
Number (in hundred thousands)	200.7	7.6	12.0	6.5
Mean EFSIQ	96.9	90.7	91.9	92.4
(Standard Error)	(.61)	(1.51)	(1.08)	(1.08)
Health/Developmental Variables† (Parent Ratings, %)				
Birth injury noted	.4%	--‡	.5%	--
Weight under 5 lbs. at birth	2.6	5.3%	3.2	7.5%
Weight over 10 lbs. at birth	1.2	2.9	.8	1.5
Poor health at age 1	1.5	2.7	2.7	2.0
First walked after 1.5 years	2.9	9.2	6.7	6.6
Spoke first real word after 1.5 years	7.9	15.7	17.1	20.8
Has been knocked unconscious	3.4	1.9	4.4	3.3
Has had a convulsion	3.1	1.5	4.2	5.2
Has trouble hearing	3.7	5.8	9.9	8.6

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*Standard errors not generated for these data.

†Variables used to establish parent indicators have not been used for comparison in this table.

‡No observations in category.

Table 50*

HOME BEHAVIOR PROFILES OF CHILDREN RECOMMENDED BY TEACHERS AS NEEDING SPEECH THERAPY, CHILDREN SELECTED BY PARENT RESPONSES, CHILDREN IDENTIFIED BY BOTH TEACHERS AND PARENTS AND CHILDREN IDENTIFIED BY NEITHER

	Neither Teacher nor Parent	Teacher Only	Parent Responses Only	Both Teacher and Parent Responses
Number (in hundred thousands)	200.7	7.6	12.0	6.5
Mean EFSIQ (Standard Error)	96.9 (.61)	90.7 (1.51)	91.9 (1.08)	92.4 (1.08)
Home Behavior Variables† (Parent Ratings, %)				
Learning speed slower than other children	2.9%	6.2%	12.2%	16.6%
Did not attend kindergarten or nursery school	30.6	33.1	31.1	29.7
Has trouble reading or doing fine work	4.1	4.6	8.4	4.9
Has only a few friends	36.7	39.9	40.8	48.4
Has difficulty getting along with other children	3.9	3.7	9.0	7.5
Is rather high-strung, tense and nervous	16.8	16.0	21.1	27.0
Has very strong temper, loses it easily	16.6	17.1	26.4	19.9
A foreign language is spoken in the home	10.5	13.0	9.6	6.1

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*Standard errors not generated for these data.

†Variables used to establish parent indicators have not been used for comparison in this table.

19.9% for children doubly identified). It was not possible, however, to test whether these differences were statistically significant.

A similar consistent pattern between groups was found in their school behavior profiles, as shown in Table 51. Doubly identified children were much more likely to be marked as having intellectual ability clearly below average (40% as compared with 17.2% for children not so identified), to be chosen last in children's play (25.1% as compared with 11.2% for children not so identified), to require frequent discipline (25.1% as compared with 11.2% for children not identified), to be too rough with other children (9.9% as compared with 4.8% for children not identified), to be extremely restless (13.5% as compared with 8% for children not identified), to be less attentive (34.2% as compared with 21.3% for children not identified), and to have repeated a grade (26.1% as compared with 12.6% for children not identified).

Children identified only from parent responses were more likely to have repeated a grade, been less attentive, rated as intellectually below average, and were somewhat less popular with schoolmates. Children identified from the teacher recommendation alone were most likely to be frequently injured (5.7% as compared with 1.4% for the doubly identified children and 2.6% for those not identified) and to be marked as "almost never chosen as leader in children's play" (41.5% as compared with 38.3% for the doubly identified children and 24.4% for children not identified).

Thus, as a whole, children identified by either parent or teacher as having speech problems clearly experienced greater health and developmental problems than children not so identified, and seemed to have more social adjustment problems in school.

Achievement

Children in the NCHS sample who were identified by teacher recommendations for speech therapy and those identified from parent responses performed significantly lower on WRAT achievement tests and had significantly lower mean EFSIQ scores than children who were not identified as having a speech problem by any source. Table 52 shows the mean WRAT

Table 51[*]

SCHOOL BEHAVIOR PROFILES OF CHILDREN RECOMMENDED BY TEACHERS AS NEEDING SPEECH THERAPY, CHILDREN SELECTED BY PARENT RESPONSES, CHILDREN IDENTIFIED BY BOTH TEACHERS AND PARENTS AND CHILDREN IDENTIFIED BY NEITHER

	Neither Teacher ncr Parent	Teacher Only	Parent Responses Only	Both Teacher and Parent Responses
Number (in hundred thousands)	200.7	7.6	12.0	6.5
Mean EFSIQ	96.9	90.7	91.9	92.4
(Standard Error)	(.61)	(1.51)	(1.08)	(1.08)
School Profile (Teacher Ratings, %)				
Academic Standing				
Repeated a grade	12.6% (1.09)[†]	22.9% (4.46)	20.9% (2.53)	26.1% (3.12)
School Behavior				
Less attentive than most for his/her age	21.3 (.83)	29.2 (2.86)	32.2 (2.62)	34.2 (3.97)
Extremely restless for his/her age (constantly moving)	8.0 (.39)	8.9 (2.02)	12.8 (1.37)	13.5 (2.89)
Frequently accused of fighting by other children	6.0 (.34)	9.6 (2.33)	7.5 (1.24)	12.1 (2.65)
Too "rough" with other children	4.8 (.29)	8.3 (2.36)	5.9 (.92)	9.9 (2.82)
Frequently injured	2.6 (.22)	5.7 (2.05)	1.7 (.79)	1.4 (1.07)
Other children's parent complain about his/her behavior	0.7 (.12)	0.4 (.41)	1.2 (.53)	0.6 (.62)

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[*] See Appendix C for tests of significance.

[†] Standard errors shown in parentheses.

Table 51* (Continued)

SCHOOL BEHAVIOR PROFILES OF CHILDREN RECOMMENDED BY TEACHERS AS NEEDING SPEECH THERAPY, CHILDREN SELECTED BY PARENT RESPONSES, CHILDREN IDENTIFIED BY BOTH TEACHERS AND PARENTS AND CHILDREN IDENTIFIED BY NEITHER

	Neither Teacher nor Parent	Teacher Only	Parent Responses Only	Both Teacher and Parent Responses
School Behavior (Continued)				
Discipline doesn't work	1.4 (.20)†	1.7 (.84)	2.6 (.76)	2.5 (1.17)
Specific disciplinary action frequently required	7.4 (.46)	5.7 (1.51)	10.3 (1.47)	12.3 (3.29)
Almost always chosen last in children's play	11.2 (.54)	19.5 (3.03)	18.1 (2.40)	25.1 (3.36)
Almost never chosen as leader in children's play	24.4 (.72)	41.5 (3.47)	36.8 (3.00)	38.3 (3.52)
Intellectual Ability				
Intellectual ability clearly below average (bottom 25%) for age	17.2 (.62)	32.7 (3.75)	28.9 (2.91)	40.0 (3.53)

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[*] See Appendix C for tests of significance.

[†] Standard errors shown in parentheses.

300

Table 52[*]

MEAN SCORES ON ACHIEVEMENT TESTS AND MEAN EFSIQ SCORES OF CHILDREN IDENTIFIED AS POTENTIAL CANDIDATES FOR SPEECH THERAPY AND CHILDREN NOT SO IDENTIFIED

	Group Means WRAT Scores (Mean=50 on both)		Group Mean EFSIQ (Mean=100)	Number (in hundred thousands)
	Reading	Math		
Teacher Recommendation or Parent Responses				
Not Identified	51.0 (.30)[†]	50.8 (.45)	96.9 (.61)	200.7
Teacher recommendation but not parent responses	46.3 (1.13)	46.6 (1.17)	90.7 (1.51)	7.6
Parent responses but not teacher recommendation	46.2 (.64)	46.0 (.81)	91.9 (1.08)	12.0
Teacher recommendation and parent responses	45.7 (.85)	46.4 (.90)	92.4 (1.08)	6.5

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[*] See Appendix C for tests of significance.

[†] Standard errors in parentheses.

reading, mean math scores, and mean EFSIQ scores for each group. The findings in Table 52 support the pattern of home and health behavior in Table 50: children who were identified as having speech problems by teachers, parents, or both have characteristics and behaviors significantly different from children not so identified. Although the extent of speech difficulties in these groups of children is unclear from the data, it is obvious that teachers and parents have identified children who are experiencing some difficulty in school and who have shown significant developmental lag.

Socioeconomic and Demographic Patterns

Table 53 presents patterns across socioeconomic and demographic variables. Statistically significant differences in demographic patterns were found for both parent-response identification and teacher recommendations for variables of sex and age. Boys were identified at a significantly higher rate than were girls and 6-7 year olds were identified at a far higher rate than were 10-11 year olds. In addition, parents of Black children reported that their child had problems in talking almost twice as frequently as parents of white children (13% as compared with 7%).

Children from low income families (income less than $5,000) were reported by their parents to have speech problems at significantly higher levels than children from families earning from $7,000 to $10,000.

As shown in Table 54, for the 8.2% of the sample reported by parents to have problems talking, the principal types of disorders reported in terms of their incidence were: hard to understand, 2.7%; stammering or stuttering, 2.0%; and lisping 1.2%. The two most prevalent speech defects reported by parents (being hard to understand and stammering or stuttering) were more prevalent among boys than girls. In Table 54 both problems are shown to decrease quite dramatically with age, from a rate of 2.9% to 1.3% at age 11 for stammering or stuttering, and from a rate of 4.3% at age 6 to 2.0% at age 11 for being hard to understand. In EPRC Research Note 19, data on the total population of school age children between the ages of 6-17 showed that the rates at which

Table 53[*]

SOCIOECONOMIC AND DEMOGRAPHIC CHARACTERISTICS OF CHILDREN IDENTIFIED AS POSSIBLE CANDIDATES FOR SPECIAL SERVICES FOR SPEECH THERAPY

Characteristic	Number of Children in the U.S.[†]	Percent Identified by Various Indicator Sets (Standard Error)		
		Teacher Recommendation for Speech Therapy[‡]	Parent Responses[‡]	Medical Risk Factors[‡]
Total	227	6.24% (.48)	8.15% (.48)	.26% (.07)
Race				
Black	31	9.46 (2.10)	13.39 (1.41)	.17 (.11)
White (includes "Other")	196	5.73 (.30)	7.31 (.42)	.27 (.09)
Sex				
Male	115	7.55 (.61)	9.63 (.50)	.30 (.10)
Female	111	4.89 (.53)	6.61 (.64)	.22 (.10)
Income				
Less than $3,000	40	7.49 (1.84)	9.75 (.99)	.32 (.21)
$3,000 to $4,999	40	7.24 (.71)	9.53 (1.09)	.17 (.12)
$5,000 to $6,999	51	5.81 (.50)	8.45 (.65)	.34 (.10)
$7,000 to $9,999	47	4.93 (.79)	5.63 (.75)	.34 (.22)
$10,000 to $14,999	27	6.76 (1.10)	7.86 (1.93)	.10[§] (.10)
$15,000 and above	11	4.34 (1.12)	6.52 (1.18)	--[**]
Don't know/no response	1[illegible]	6.15 (1.33)	8.71 (1.59)	.32[§] (.33)
Age				
6-7	76	8.37 (.97)	10.81 (.84)	.35 (.14)
8-9	77	6.31 (.62)	7.13 (.89)	.19 (.07)
10-11	74	3.97 (.43)	6.45 (.60)	.23 (.14)
Region				
Northeast	51	6.43 (.48)	7.76 (.73)	.37 (.16)
Midwest	65	6.36 (.61)	8.49 (.84)	.57 (.2[illegible])
South	54	6.21 (1.55)	8.43 (1.14)	.05[§] (.05)
West	56	5.97 (.66)	7.82 (.77)	--
			7.73 (.57)	
Type of Place				
Rural	76	5.53 (.92)	7.73 (.57)	.17 (.08)
Urban, under 50,000	34	6.45 (.60)	8.73 (1.49)	.23 (.06)
50,000-250,000 people	17	3.12 (2.12)	6.97 (.55)	--
250,000-3 million	57	7.00 (.62)	7.48 (.80)	.42 (.20)
Over 3 million people	43	7.57 (.56)	9.77 (1.33)	.33 (.22)

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[*] See Appendix C for tests of significance.

[†] In hundred thousands.

[‡] Includes all children so identified, whether or not those children were also identified by another set of indicators.

[§] Sample too small to permit drawing valid conclusions.

[**] No observations in category.

Table 54

PERCENT OF CHILDREN HAVING HAD PROBLEMS WITH TALKING, BY AGE AND SEX, WITH THE CORRESPONDING STANDARD ERROR: UNITED STATES, 1963-1965

Age and sex	Problem with talking							No problem with talking	Unknown
	Total	Stammered or stuttered	Lisped	Hard to understand	Other	More than one	Type unknown		
	Percent of children								
Both sexes									
6-11 years	8.4	2.0	1.2	2.7	1.9	0.0	0.6	91.3	0.4
6 years	12.8	2.9	2.0	4.3	2.9	0.1	0.6	86.7	0.4
7 years	9.6	2.2	1.4	3.0	2.0	0.1	0.9	90.0	0.5
8 years	7.5	2.0	1.3	2.4	1.5	0.1	0.2	92.0	0.6
9 years	7.1	1.8	0.8	2.7	1.4	-	0.4	92.7	0.3
10 years	6.8	1.8	0.3	1.9	2.0	0.1	0.7	93.0	0.2
11 years	6.2	1.3	1.2	2.0	1.5	-	0.2	93.6	0.2
Boys									
6-11 years	9.9	2.9	1.0	3.4	2.0	0.1	0.5	89.7	0.4
6 years	14.8	4.5	1.8	5.0	2.9	0.3	0.3	84.8	0.4
7 years	11.2	2.8	1.5	4.1	2.3	-	0.5	88.2	0.6
8 years	8.8	3.4	1.0	2.8	1.5	0.1	0.0	90.7	0.5
9 years	8.6	2.4	0.6	3.5	1.6	-	0.5	91.1	0.3
10 years	8.4	2.2	-	2.6	2.6	-	1.0	91.2	0.3
11 years	7.6	1.7	1.3	2.6	1.2	-	0.6	92.4	0.2
Girls									
6-11 years	6.8	1.1	1.3	2.0	1.8	0.0	0.6	92.9	0.3
6 years	10.9	1.3	2.2	3.6	3.0	-	0.8	88.6	0.2
7 years	7.9	1.5	1.3	1.9	1.8	0.1	1.3	91.8	0.3
8 years	6.1	0.6	1.6	1.9	1.6	-	0.4	93.2	0.6
9 years	5.5	1.1	0.9	1.8	1.3	-	0.4	94.3	0.2
10 years	5.1	1.4	0.7	1.3	1.4	0.2	0.1	94.8	0.1
11 years	4.9	0.8	1.0	1.4	1.7	-	0.0	94.8	0.2
	Standard error of percent of children								
Both sexes 6-11 years	0.47	0.25	0.19	0.25	0.16	*	*	0.46	0.09
Boys									
6-11 years	0.47	0.38	0.20	0.36	0.25	0.02	*	0.48	0.11
6 years	1.35	1.07	0.67	0.82	0.79	0.19	*	1.41	0.23
7 years	0.90	0.66	0.56	0.90	0.69	-	*	0.88	0.32
8 years	1.34	0.86	0.47	0.65	0.74	0.12	*	1.44	0.38
9 years	1.33	0.56	0.24	0.83	0.47	-	*	1.29	0.11
10 years	1.55	0.62	-	0.74	0.63	-	*	1.53	0.23
11 years	9.83	0.42	0.42	0.50	0.46	-	*	0.84	0.18
Girls									
6-11 years	0.63	0.23	0.26	0.25	0.29	*	*	0.61	0.13
6 years	1.59	0.44	0.69	0.75	0.75	-	*	1.55	0.16
7 years	1.46	0.51	0.47	0.51	0.77	0.14	*	1.44	0.19
8 years	0.93	0.34	0.67	0.36	0.50	-	*	1.00	0.49
9 years	0.97	0.44	0.37	0.57	0.50	-	*	1.01	0.17
10 years	0.87	0.64	0.35	0.58	0.50	0.15	*	0.87	0.12
11 years	1.01	0.40	0.39	0.44	0.75	-	*	0.97	0.20

Source: Parent Ratings of Behavioral Patterns of Children, NCHS Publication Series 11, Number 108, (November, 1971) pg. 31.

teachers recommended students for speech therapy showed a similar dramatic decline. Figure 20 illustrates the decline across age and sex for teacher recommendations of special need for the entire 6-17 year-old population. The rates reported by parents in these data are consistent with those reported by other researchers on rates of parent identification.*

Exhibit 4

TYPES OF SPEECH IMPAIRMENT

It is generally agreed among researchers that articulation defects are the most common speech problem and exist in approximately 75-80% of the speech impaired population (Stewart, 1969; Dinnage, 1972). Disorders in fluency, such as stuttering or stammering, are present in about 20% of all speech-impaired students (Morley, 1965), while cleft palate and other language defects occur in relatively few children (Bulter and Alberman, 1969). In a study of 1,000 children born in one region of Britain in 1947 it was found that the rate of articulation defects dropped from a rate of 11% in the total population at 5 years of age to 3% by the time the children had reached 6.5 years of age. Similarly, the study found that 75% of the children who were identified as stutterers had overcome their difficulty by the age of 11, and many had overcome it by age 9. The general view appears to be that while a large number of children may exhibit imperfect speech patterns in their early years, the proportion of children who are seriously speech handicapped is quite small. However, most studies of prevalence have been limited to informal methods of identification, such as relying on reports of teachers, parents, or medical examiners. Thus, the true population of children who do not "outgrow" their handicap is probably much lower than rates generally reported.

Most serious speech problems are often associated with other handicapping conditions such as hearing impairment, mental retardation, and emotional disturbance which compound the complexity of remedial efforts for these children.

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*J. C. Glidewell, "Studies of Mothers' Reports of Behavior Symptoms in Their Children," Chapter 9, in S. B. Sells, ed., The Definition and Measurement of Mental Health, Public Health Service, NCHS, Washington, 1968; D. McCarthy, "Language Development in Children," Chapter 9 in L. Carmichael, ed., Manual of Child Psychology, New York, John Wiley and Sons, Inc., 1954; and E. A. Davis, "The Development of Linguistic Skills in Twins, Singletons with Siblings, and Only Children from Age Five Through Ten Years," Institute for Child Welfare, Monograph, Series No. 14, Minneapolis, University of Minnesota Press, 1937.

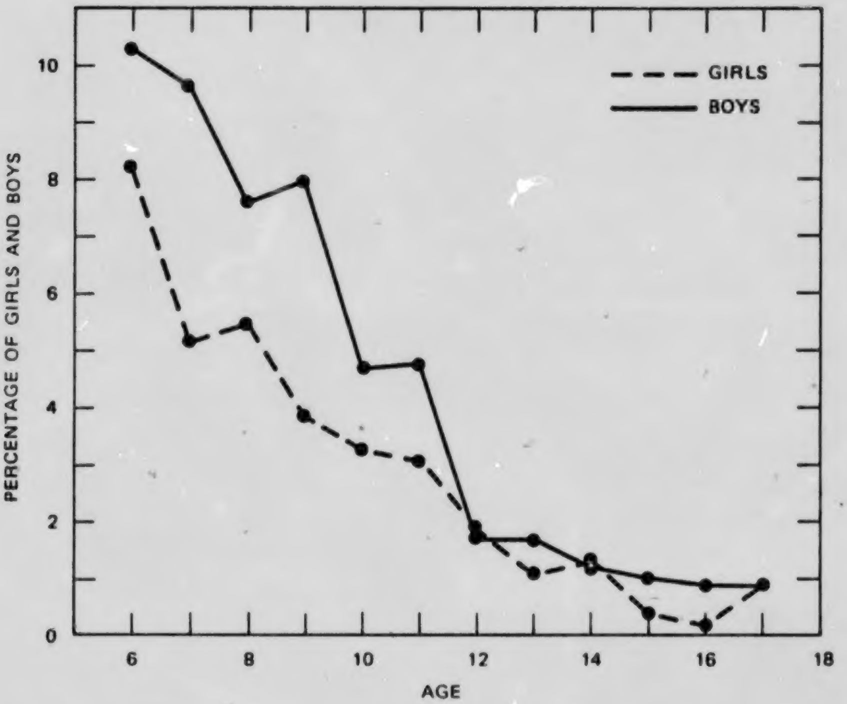

FIGURE 20 COMPARISON BETWEEN PERCENTAGE OF BOYS AND GIRLS AGES 6-17 FOR WHOM SPEECH THERAPY WAS RECOMMENDED BY THE TEACHER

As with other sections of this study it was of interest to examine the extent to which patterns found across socioeconomic and demographic factors and various indicators of possible need might also exist in terms of the use of special resources. Table 55 presents these distributions across availability and use of resources for students who may be potential candidates for speech therapy. Several patterns are consistent with differences found among indicators in Table 53. That is, boys were receiving services at a higher rate than were girls (3.6% compared to 2.3%); more Black children were receiving services than were Whites (3.5% compared to 2.9%) and Black students appeared to have fewer services available to them than did Whites (2.8% for Blacks compared to 1.3% for Whites); and young children were participating at a higher rate than were older children (3.9% for 6-7 year olds compared to 1.8% for 10-11 year olds). There appeared to be no consistent differences across income for those children receiving services; however, there is an indication that children from families earning less than $3,000 did not have services available to them to the same extent that children from other income groups did. Again, as with other special educational resources, children in the South and from rural areas appeared to have fewer services available to them than did those from other regions and areas.

Summary and Conclusions

Using indicators developed from teacher, parent, and medical examination information on children, identification of possible speech problems was undertaken for children in the sample. Teachers and parents identified a large proportion of students (6.3% and 8.2%) as possible candidates for speech therapy while the medical examination indicator set identified a very small group of children (0.3%).

Comparing groups of children, we explored differences in home and school behaviors, health variables, and mean achievement and mean EFSIQ scores. The availability and use of resources by these groups of children were compared. The findings are as follows:

- Approximately 3% of the total school population were identified by both teacher recommendation and parent responses as having speech difficulties.

Table 55*

SOCIOECONOMIC AND DEMOGRAPHIC STATUS, CHILDREN USING AND NOT USING SPEECH THERAPY RESOURCES WHO WERE RECOMMENDED FOR SUCH RESOURCES BY THE TEACHER

	Percent				Number (in thousands)			
	Total Group Recommended by Teacher†	Resources Used	Resources Available Not Used	Resources Not Available	Total Group Recommended by Teacher†	Resources Used	Resources Available Not Used	Resources Not Available
Total	6.2%	3.0%	1.2%	1.5%	1416.1	671.1	272.2	346.9
Sex								
Male	7.6	3.6	1.6	1.6	870.7	420.3	187.0	188.9
Female	4.9	2.3	.8	1.4	545.4	250.8	85.2	158.0
Race								
Black	9.5	3.5	2.0	2.8	294.2	110.2	61.1	85.8
White	5.7	2.9	1.1	1.3	1121.9	561.0	211.1	261.0
Income								
Under $3,000	7.5	2.2	.6	3.6	303.4	89.4	25.8	145.9
$3,000-$4,999	7.2	3.6	1.6	1.2	290.5	144.2	66.0	47.2
$5,000-$6,999	5.8	3.2	1.3	.9	294.7	164.3	68.0	44.5
$7,000-$9,999	4.9	2.4	1.1	1.1	229.5	110.9	52.9	50.5
$10,000-$14,999	6.8	3.7	1.4	1.3	183.1	100.8	38.2	35.1
Over $15,000	4.3	2.0	1.1	.8	45.9	21.1	11.4	8.4
Age								
6-7	8.4	3.9	1.7	1.9	638.1	301.0	127.4	147.9
8-9	6.3	3.1	1.1	1.6	485.4	240.7	87.6	123.6
10-11	4.0	1.8	.8	1.0	292.6	129.5	57.3	75.4
Region								
Northeast	6.4	3.4	1.2	1.4	330.2	174.6	60.4	74.3
Midwest	6.4	3.2	1.6	1.1	414.8	209.7	104.4	70.3
South	6.2	1.6	.9	2.9	336.7	85.6	47.0	156.8
West	6.0	3.6	1.1	.8	334.4	201.2	60.4	45.5
Area Population								
Rural	5.5	1.7	.7	2.5	421.9	127.2	56.6	193.5
Urban, under 50,000	6.5	3.3	1.2	1.1	219.1	110.6	42.5	38.3
50,000 to 250,000 people	3.1	1.9	.6	.3	51.9	30.9	9.6	5.0
250,000 to 3 million people	7.0	4.1	1.7	.8	400.9	237.7	98.4	46.1
Over 3 million people	7.6	3.9	1.5	1.5	322.3	164.8	65.1	64.0

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*Standard errors not generated for these data.

†Total includes children for whom the availability of special resources was not known or may not add due to rounding.

- Approximately three out of four of the children identified by the medical examination were also identified by the teacher. However, this is a very small proportion, only 0.2%, of the total population. It is evident that teachers are able to recognize most severe speech problems, however the medical examination by itself identifies a very restricted group of children.
- Of all the children using special resources for speech therapy, 51% were identified by the teacher recommendation alone.
- Children identified by either the teacher or teacher and parent as having a speech problem differed significantly from children who were not so identified with respect to school behaviors, developmental histories, and school achievement in reading, math, and EFSIQ (all groups scored significantly below the mean on all tests).
- Boys were identified at significantly higher rates by teachers and parents than were girls, but there were no apparent sex differences found using medical examination risk factors.
- Children from low-income families were identified at significantly higher rates by parent indicators and teachers but not medical factors.
- Children 6-7 years old were identified at significantly higher rates by both teachers and parents than were children 10-11 years old.
- Black parents reported children having problems talking almost twice as frequently as White parents.
- Several differences in the use of services were found to be consistent with differences found across indicators of possible need. Boys, Blacks, and younger children (6-7 year olds) were receiving services at a higher rate than were girls, Whites, and older children (10-11 year olds). There was also an indication that fewer resources were available to children from low-income families (less than $3,000), those from the South, and from rural areas.

VI OTHER HANDICAPS

This section presents information on children recommended for resources for the slow learner and children for whom two or more special resources were recommended. The latter group, for purposes of this report, have been classified as the multiply handicapped. For both the slow learner and multiply handicapped groups, it was difficult to establish appropriate indicators among parent responses, medical findings, and test scores to compare with teacher recommendations of need. A brief discussion of the scope of analysis for these two groups is presented in the following sections.

Multiply Handicapped

Our study of the multiply handicapped population is restricted to a description of the rates of teacher identified need for two or more services, and to a description of the combinations of resources recommended. One reason for this limitation is that the term, multiply handicapped, is somewhat ambiguous. For instance, a child who is mentally retarded is likely to be described also as a slow learner. The additional handicap however, is already implied by a diagnosis of mental retardation. Of interest to the formulation of public policy is the implication of this relationship for program design and the allocation of resources. For example, does the acknowledgment of a set of handicaps imply need for one highly personalized or several independent special educational services? For purposes of this study we have defined a multiple handicap as a recommendation of need for two or more special educational resources (including resources for "slow learners").

As shown in Table 56, approximately 4% of the population in school (and for whom school data were available) were recommended for two or more special resources, while 23% were recommended for only one resource.

Table 56

PERCENT OF POPULATION IN SCHOOL FOR WHOM DATA WERE AVAILABLE WHO WERE RECOMMENDED BY TEACHERS FOR MORE THAN ONE SPECIAL RESOURCE*

Number of Resources Recommended	Population in School for Whom Data Were Available	
	Percent	(number in thousands)
0	73.2%	166.1
1	22.9	51.9
2	3.3	7.5
3	0.5	1.0
4	0.1	0.2
5	0.0†	0.04
Total	100.0%	226.8
Total Recommended for 2 or More Resources	3.9%	8.8

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*"Other" resources not tabulated.

†Less than 1/10 of 1%.

Table 57 shows the distribution of children recommended for only one resource across resources. Among children identified for one resource only, services for slow learners and speech-handicapped children were most often recommended.

Groups of children recommended for two or more special resources were further examined to determine the combinations of resources recommended. Table 58 presents this information. Children recommended for services for the hearing-impaired or mentally retarded were likely to be recommended for an additional service by their teachers (49.3% and 50.1%). Among children recommended for two or more services, "slow-learner" resources were most often also suggested.

As expected, several handicaps appear to cluster together. For instance, teacher identified hearing-handicapped children recommended for hearing resources were often recommended for speech resources as well (22.8%). Speech resources were also frequently recommended for children identified as needing special resources for the orthopedically handicapped or mentally retarded (17% and 24%). Mental retardation was most frequently paired with recommendations for speech therapy problems and resources for the emotionally disturbed. Surprisingly, children identified as orthopedically handicapped were often also recommended for vision services.

Conclusions

Of all the children recommended by teachers for special resources, approximately 880,000, or 3.9% were recommended for two or more resources. Children most often recommended for multiple services were those identified as hearing-impaired and mentally retarded.

Slow Learners

The school questionnaire asked the teacher to specify whether a child should be recommended for "special provision for 'slow learners.'" Approximately 13% of the children in the survey were recommended for this service. Unfortunately, the classification was not defined and was therefore ambiguous. Because of the ambiguity in this category we have not

Table 57

DISTRIBUTION OF CHILDREN RECOMMENDED BY TEACHERS FOR ONE SPECIAL RESOURCE,* BY RESOURCE

	Single Handicapped*	
	Percent	Number (in hundred thousands)
Special Resource for:		
Hearing impaired	2.9%	1.2
Vision impaired	5.2	2.2
Orthopedically handicapped	1.2	.5
Mentally retarded	3.3	1.4
Emotionally disturbed	10.7	4.5
Speech handicapped	21.7	9.1
Slow learner	55.0	23.1
Total	100.0%	42.0

---

*"Other" resources not tabulated.

Table 58

THE DISTRIBUTION OF ADDITIONAL SERVICES AMONG CHILDREN RECOMMENDED FOR ONE OR MORE SPECIAL SERVICES BY HANDICAP*

Resource Recommended	Total N† Recommended For This Resource	Percent (N)† Recommended		Percent of Those Recommended for 2 or More Resources Also Recommended for Each of the Following Services:						
		Only for This Resource	2 or More Resources*	Hearing	Vision	Orthopedic	MR	ED	Speech	Slow Learner
Hearing	237.9	50.7% (123.4)	49.3% (114.5)		3.5% (8.2)	.9% (2.2)	3.0% (7.2)	2.1% (5.1)	22.8% (54.2)	24.7% (58.9)
Vision	329.7	68.3 (225.3)	31.7 (104.4)	2.5 (8.2)		3.0 (9.8)	3.9 (12.7)	3.9 (12.8)	8.8 (29.1)	14.6 (48.2)
Orthopedic	75.5	66.7 (50.4)	33.3 (25.1)	2.9 (2.2)	13.0 (9.8)		4.8 (3.3)	9.0 (6.8)	17.4 (13.1)	10.8 (8.2)
Mentally Retarded (MR)	279.7	49.9 (139.7)	50.1 (140.0)	2.6 (7.2)	4.5 (12.7)	1.2 (3.3)		22.0 (61.6)	24.4 (68.3)	28.8 (80.7)
Emotionally Disturbed (ED)	763.6	59.5 (454.3)	40.5 (309.3)	.7 (5.1)	1.7 (12.8)	.9 (6.8)	8.1 (61.6)		9.7 (74.3)	29.0 (221.5)
Speech	1,416.1	64.2 (909.6)	35.8 (506.4)	3.7 (51.8)	2.1 (29.1)	.9 (13.1)	4.8 (68.3)	5.2 (74.3)		25.4 (359.3)
Slow Learner	2,972.6	77.8 (2,313.1)	22.2 (659.4)	2.0 (58.9)	1.6 (48.2)	.3 (8.2)	2.7 (80.7)	7.5 (221.5)	12.1 (359.3)	

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[*] "Other" Resources not tabulated

[†] Number in thousands

attempted to develop an operational definition, but rather have chosen simply to characterize and describe children identified by teachers as "slow" on the basis of their academic standing, achievement, school and home behaviors and health histories. It is quite possible that some children in this group may have learning problems that today would be referred to as "specific learning disabilities." However, it is not within the scope of this report to explore this possibility.

In order to describe the "slow learners," the total school populations for whom data were available were divided into three groups:

- Children recommended only for resources for the "slow learner"
- Children recommended for another special resource in addition to resources for the "slow learner"
- Children not recommended for any special resource.

Table 59 presents school behavior and achievement profiles for each of the above groups. With respect to academic standing, children recommended only for "slow learner" services and those recommended for one or more additional services were far more likely to repeat a grade (37.8% and 49.6%) than children not identified for services, (8.6%).

In looking at differences in school behavior as reported by teachers, the two groups recommended for a special resource for slow learners were far more likely to display disruptive and socially unacceptable school behaviors than were children not identified as requiring special resources. Of particular interest is the magnitude of the rating related to attention span for both groups of slow learners. Over 60% of the two groups of children identified as "slow" were rated as "less attentive than most children for his or her age," as opposed to only 14.7% for children not recommended for any special resource. These two groups were also reported to require far more frequent discipline than other children.

Comparison of these groups of children in terms of their home behaviors and health profiles revealed consistent differences in reported health histories and home behaviors for children identified as slow learners (Tables 60 and 61). Of special interest in Table 60 is the fact

Table 59*

SCHOOL BEHAVIOR PROFILES OF CHILDREN RECOMMENDED BY TEACHERS AS NEEDING SPECIAL RESOURCES ONLY FOR "SLOW LEARNERS," CHILDREN RECOMMENDED FOR RESOURCES FOR "SLOW LEARNERS" AND FOR OTHER SPECIAL RESOURCES, AND CHILDREN NOT RECOMMENDED FOR ANY RESOURCE

	Neither "Slow Learner" nor Other Special Resource	Only for "Slow Learner"	"Slow Learner" and Other Special Resource
Number (in hundred thousands)	166.1	23.1	6.6
Mean EFSIQ	97.6	87.7	83.6
(Standard Error)	(.58)	(.94)	(1.11)
School Profile (Teacher Ratings, %)			
Academic Standing			
Repeated a grade	8.6% (1.05)†	37.8% (3.31)	49.6% (3.71)
School Behavior			
Less attentive than most for his/her age	14.7 (.70)	62.5 (2.50)	61.6 (5.71)
Extremely restless for his/her age (constantly moving)	5.3 (.36)	17.4 (2.38)	29.1 (5.01)
Frequently accused of fighting by other children	3.9 (.22)	11.9 (1.53)	17.9 (3.04)
Too "rough" with other children	3.1 (.27)	10.5 (1.07)	15.8 (3.35)
Frequently injured	2.0 (.23)	3.2 (.77)	6.2 (2.15)
Specific disciplinary action frequently required	5.0 (.38)	14.3 (1.63)	20.9 (3.92)

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*See Appendix C for tests of significance.

†Standard error shown in parentheses.

Table 59* (Continued)

SCHOOL BEHAVIOR PROFILES OF CHILDREN RECOMMENDED BY TEACHERS AS NEEDING SPECIAL RESOURCES ONLY FOR "SLOW LEARNERS," CHILDREN RECOMMENDED FOR RESOURCES FOR "SLOW LEARNERS" AND FOR OTHER SPECIAL RESOURCES, AND CHILDREN NOT RECOMMENDED FOR ANY RESOURCE

	Neither "Slow Learner" nor Other Special Resource	Only for "Slow Learner"	"Slow Learner" and Other Special Resource
School Behavior (Continued)			
Other children's parent complain about his/her behavior	.4 (.09)†	1.0 (.37)	2.8 (1.38)
Discipline doesn't work	.6 (.12)	3.0 (.72)	5.9 (2.0)
Almost always chosen last in children's play	7.7 (.42)	31.3 (2.80)	45.1 (4.33)
Almost never chosen as leader in children's play	18.6 (.62)	59.9 (2.36)	72.9 (3.69)
Intellectual Ability			
Intellectual ability is clearly below average (bottom 25%) for age	8.0 (.43)	81.3 (1.68)	81.9 (3.43)

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[*] See Appendix C for tests of significance.

[†] Standard error shown in parentheses.

Table 60*

HOME BEHAVIOR PROFILES OF CHILDREN RECOMMENDED BY TEACHERS AS NEEDING SPECIAL RESOURCES ONLY FOR "SLOW LEARNERS," CHILDREN RECOMMENDED FOR RESOURCES FOR "SLOW LEARNERS" AND FOR OTHER SPECIAL RESOURCES, AND CHILDREN NOT RECOMMENDED FOR ANY RESOURCE

	Neither "Slow Learner" nor Other Special Resource	Only for "Slow Learner"	"Slow Learner" and Other Special Resource
Number (in huddred thousands)	166.1	23.1	6.6
Mean EFSIQ (Standard Error)	97.6 (.58)	87.7 (.94)	83.6 (1.11)
Home Behavior Variables (Parent Ratings, %)			
Learning speed slower than other children	2.6%	7.7%	12.1%
Did not attend kindergarten or nursery school	29.1	42.4	43.5
Has trouble reading or doing fine work	3.5	8.5	5.2
Has only a few friends	36.2	38.6	43.3
Has difficulty getting along with other children	3.5	6.2	5.9
Is rather high-strung, tense and nervous	15.6	20.0	26.2
Has very strong temper, loses it easily	16.1	21.4	18.9
A foreign language is spoken in the home	10.2	15.1	6.7

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[*] Standard errors not generated on these data.

Table 61*

DEVELOPMENTAL PROFILES OF CHILDREN RECOMMENDED BY TEACHERS AS NEEDING SPECIAL RESOURCES ONLY FOR "SLOW LEARNERS," CHILDREN RECOMMENDED FOR RESOURCES FOR "SLOW LEARNERS" AND FOR OTHER SPECIAL RESOURCES, AND CHILDREN NOT RECOMMENDED FOR ANY RESOURCE

	Neither "Slow Learner" nor Other Special Resource	Only for "Slow Learner"	"Slow Learner" and Other Special Resource
Number (in hundred thousands)	166.1	23.1	6.6
Mean EFSIQ	97.6	87.7	83.6
(Standard Error)	(.58)	(.94)	(1.11)
Health/Developmental Variables (Parent Ratings, %)			
Birth injury noted	.4%	.5%	--†
Weight under 5 lbs. at birth	2.4	4.0	4.5%
Weight over 10 lbs. at birth	1.1	1.3	2.2
Poor health at age 1 year	1.4	1.7	3.5
First walked after 1.5 years	2.5	6.0	14.0
Spoke first real word after 1.5 years	7.9	12.7	22.2
Has been knocked unconscious	3.4	3.8	4.2
Has had a convulsion	3.0	3.1	5.5
Has trouble hearing	3.6	3.1	6.3

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*Standard errors not generated for these data.

†No observations in category.

that over 40% of the children identified as "slow learners" by teachers were reported to have missed attending either kindergarten or nursery school. Children identified as "slow learners" were also reported at higher rates by parents to be slower in learning than other children and slower in learning to walk and talk than the average. Moreover, twice as many children identified as "slow" had birth weights below average.

A comparison between teacher ratings of intellectual ability and mean test scores for each group (Table 62) shows a clear difference between both groups of slow learners and those not identified. Of the children recommended by teachers for slow learner resources, 81% were rated as performing clearly below average (Table 59). Comparison of mean scores for individually administered WRAT math, and reading tests, and EFSIQ scores for these groups appear to support the teachers' perception. Both groups of slow learners performed significantly below the mean in reading, math, and the EFSIQ test. Slow learners who were also recommended for one or more additional resources performed slightly less well than those recommended for slow learner resources only. However, neither group had test scores low enough to merit classification as mentally retarded.

Table 63 shows how each of these groups differs across socioeconomic and demographic characteristics. Both slow learner groups are shown to have a higher proportion of Black children, boys, and children from low income families. Most of these children could probably be more accurately characterized as economically and culturally disadvantaged rather than being "handicapped" as that term is used in the Federal legislation. These findings lead us to believe that many children in the NCHS "slow learner" group may represent the ESEA Title I population. Among the group identified as slow learners may also be children who might be diagnosed today as specifically learning disabled.

In looking at differences in rates of recommendations based on socioeconomic and demographic characteristics and the rate at which children were actually receiving resources, only two patterns seemed to be consistent with differences found in Table 64. That is, boys were receiving resources at a higher rate than were girls (3.6% compared to 2.1) and children from low-income families (income under $7,000) were

Table 62[*]

MEAN SCORES ON ACHIEVEMENT TESTS AND MEAN EFSIQ SCORES OF CHILDREN IDENTIFIED AS POTENTIAL CANDIDATES FOR SERVICES FOR THE SLOW LEARNER AND CHILDREN NOT SO IDENTIFIED

	Group Mean WRAT Scores (Mean=50 on both)		Group Mean EFSIQ (Mean=100)	Number (in hundred thousands)
	Reading	Math		
Teacher Recommendation for Slow Learner Only or for Slow Learner plus one Other Handicap				
Not identified	51.8 (.25)[†]	51.6 (.46)	97.6 (.58)	166.1
Teacher recommendation for slow learner only	41.8 (.53)	43.0 (.68)	87.7 (.94)	23.1
Teacher recommendation for slow learner plus one other handicap	39.2 (.84)	40.0 (.78)	83.6 (1.11)	6.6

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[*] See Appendix C for tests of significance.

[†] Standard errors in parentheses.

Table 63*

SOCIOECONOMIC AND DEMOGRAPHIC CHARACTERISTICS OF CHILDREN IDENTIFIED AS POSSIBLE CANDIDATES FOR SERVICES FOR THE SLOW LEARNER

Characteristic	Number of Children in the U.S.†	Percent Identified by Teacher Recommendation (Standard Error)	
		Only Slow	Slow and Other Special Resource‡
Total	227	10.2% (.55)	2.9
Race			
Black	31	17.0 (2.82)	6.3
White (includes "Other")	196	9.1 (.56)	2.4
Sex			
Male	115	12.0 (.77)	3.4
Female	111	8.4 (.55)	2.4
Income			
Less than $3,000	40	15.1 (1.91)	5.9
$3,000 to $4,999	40	13.4 (.82)	4.1
$5,000 to $6,999	51	10.1 (1.05)	2.0
$7,000 to $9,999	47	7.3 (1.10)	1.6
$10,000 to $14,999	27	4.6 (.98)	1.4
$15,000 and over	11	3.9 (1.11)	2.0
Don't know/no response	11	13.2 (3.33)	
Age			
6-7	76	8.7 (.66)	3.1
8-9	77	10.5 (.75)	3.0
10-11	74	11.4 (.97)	2.6
Region			
Northeast	51	9.2 (1.27)	1.8
Midwest	65	7.9 (.61)	2.6
South	54	13.0 (1.23)	4.4
West	56	11.0 (1.27)	2.8
Type of Place			
Rural	76	10.6 (.90)	3.7
Urban, under 50,000 people	34	10.5 (1.19)	1.7
50,000-250,000	17	10.4 (3.74)	3.4
250,000-3 million people	57	9.2 (.73)	2.8
Over 3 million people	43	10.5 (1.18)	2.5

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*See Appendix C for tests of significance.

†In hundred thousands.

‡Standard errors not generated for these data.

Table 64*

SOCIOECONOMIC AND DEMOGRAPHIC STATUS, CHILDREN USING AND NOT USING SPECIAL RESOURCES FOR SLOW LEARNERS WHO WERE RECOMMENDED ONLY FOR SUCH RESOURCES BY THE TEACHER

	Percent				Number (in thousands)			
	Total Group Recommended by Teacher†‡	Resources Used	Resources Available Not Used	Resources Not Available	Total Group Recommended by Teacher†‡	Resources Used	Available Not Used	Resources Not Available
Total	10.2%	2.9%	1.3%	5.0%	2313.1	647.3	290.5	1123.4
Sex								
Male	12.0	3.6	1.4	6.0	1382.4	411.4	165.3	695.3
Female	8.4	2.1	1.1	3.8	930.7	236.0	125.2	428.1
Race								
Black	17.0	2.9	2.5	9.2	528.0	90.1	77.3	286.2
White	9.1	2.8	1.1	4.3	1785.2	557.2	213.2	837.2
Income								
Under $3,000	15.1	2.7	1.5	8.9	612.6	110.1	62.3	359.7
$3,000-$4,999	13.4	3.3	1.7	6.9	536.7	131.0	69.7	278.3
$5,000-$6,999	10.1	3.4	1.2	4.3	510.8	174.3	59.8	218.7
$7,000-$9,999	7.3	2.5	1.1	2.8	339.3	115.2	49.6	132.3
$10,000-$14,999	4.6	1.6	1.0	1.8	124.8	43.6	26.9	50.0
Over $15,000	3.9	1.5	.4	2.0	41.2	15.9	4.6	20.7
Age								
6-7	8.7	2.6	.9	4.1	665.2	199.1	71.0	313.9
8-9	10.5	2.9	1.7	4.7	807.0	222.6	127.8	360.0
10-11	11.4	3.1	1.2	6.1	840.9	225.7	91.7	449.5
Region								
Northeast	9.2	2.9	1.5	4.2	470.4	148.9	77.7	214.1
Midwest	7.9	2.8	1.0	3.3	516.9	182.1	63.6	217.8
South	13.0	2.0	1.2	7.8	706.7	109.8	65.7	423.[illegible]
West	11.1	3.7	1.5	4.8	619.2	206.5	83.5	268.[illegible]
Area Population								
Rural	10.6	2.1	.9	5.9	808.0	159.1	68.0	451.2
Urban, under 50,000	10.5	3.7	1.5	4.2	356.2	125.0	50.1	141.1
50,000 to 250,000 people	10.4	3.2	.7	5.7	173.2	53.9	11.0	94.8
250,000 to 3 million people	9.2	3.1	1.4	4.2	528.9	175.2	80.2	240.4
Over 3 million people	10.5	3.2	1.9	4.6	446.8	134.2	81.2	195.9

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*Standard errors not generated for these data.

†Total includes children for whom the availability of special resources was not known or may not add due to rounding.

‡Children identified only as "slow Learners."

participating at higher rates than were children from families above $7,000. There was no indication however, that Blacks were participating at higher rates than Whites nor were there any major differences in the rate at which children were receiving resources across age, region, or type of place. There was some indication that fewer resources were available for boys, Blacks, older children, and those from low-income families. However, it is well to remember that it is not possible to determine whether a handicap actually existed and therefore the fact that resources were not available for a child recommended for services by the teachers does not necessarily indicate that that child required the resource.

Summary and Conclusions

In the absence of any definitions in the NCHS questionnaires regarding what was meant by the term "slow learner," it was not possible to establish from the data specific criteria for comparison. Therefore children who were identified by teacher recommendation as being slow learners were described in terms of school and home behaviors, health/developmental variables, and test scores. Comparisons were also made in terms of socioeconomic and demographic characteristics. Conclusions are presented below:

- Children recommended by teachers for services for the "slow learner" displayed far more disruptive and socially unacceptable school behaviors than children not so identified.
- More than 40% of the children identified as "slow learners" had not attended either nursery school or kindergarten, compared with only 29% of the children not so identified.
- "Slow learners," as identified by the teacher, performed significantly below the mean in reading and math, and in EFSIQ scores but did not score low enough to be classified as mentally retarded.
- A significantly higher proportion of Black children, boys, and children from low-income families were identified by teachers as "slow learners," but only boys and children from low-income families were actually receiving services at a higher rate.

The findings from this analysis lead us to believe that many children in the NCHS "slow learner' group may represent the ESEA Title I population as well as children who today might be diagnosed as learning disabled.

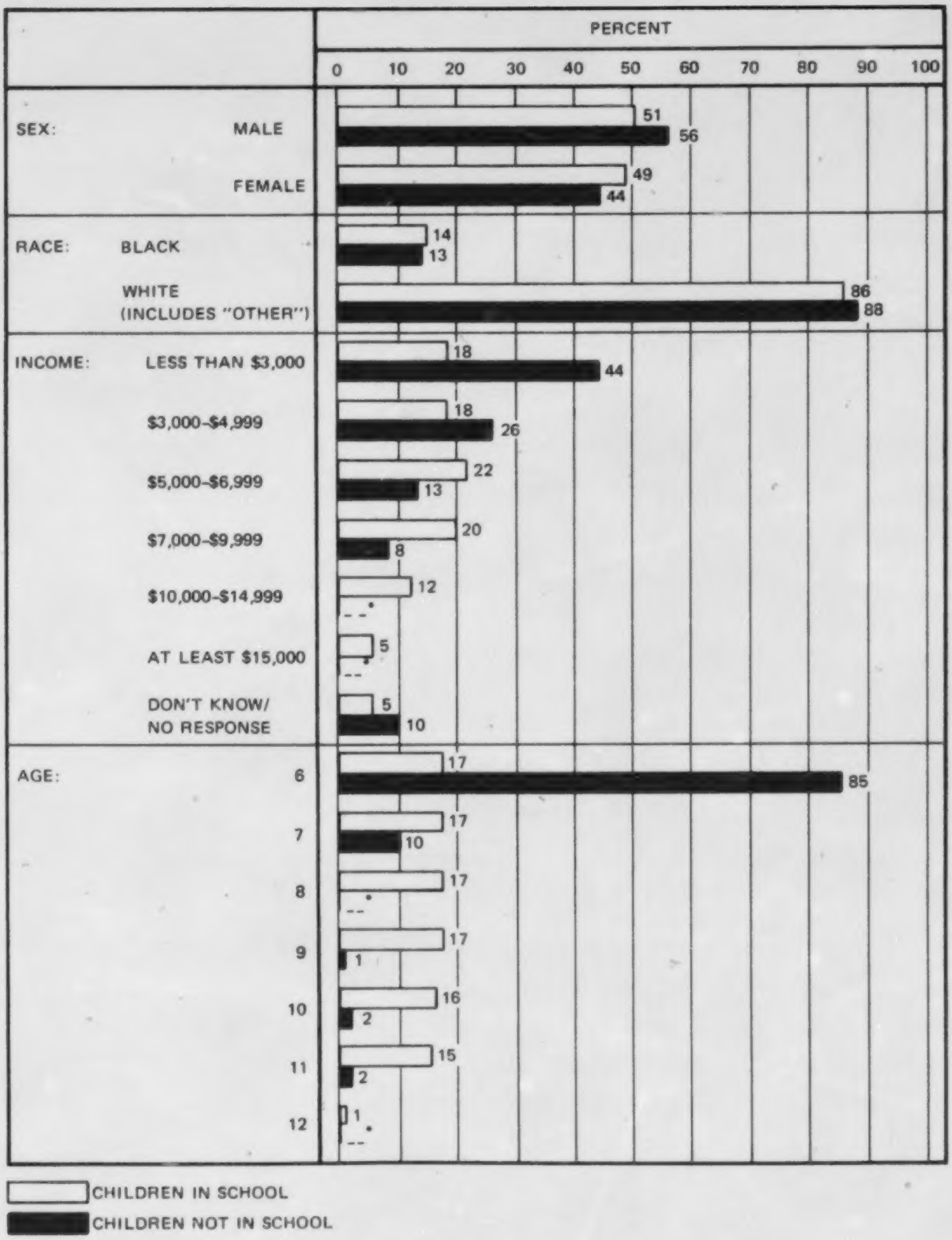
VII CHARACTERISTICS OF CHILDREN NOT IN SCHOOL

Of the noninstitutionalized population of children aged 6 to 11 years, an estimated 0.8% were not in school at the time of the NCHS survey. This constituted about 183,000 of 23.8 million children in the total population in 1964.

Two questions of particular interest in this study were: (1) what characteristics distinguish the out-of-school population from the group of children in school, and (2) what are the possible differences in rates of need for special resources between the two groups?

Figure 21 illustrates how the population in school and not in school differ on a number of demographic and socioeconomic characteristics. The most striking difference is that 85% of the children not in school in 1964 were 6 years old, while only 17% of those in school were 6 year olds. There are also marked differences in terms of region, income, and size of place of residence. That is, about 86% of the children not in school were from the West or South, in contrast to only 49% of the children in school. About 44% of the children not in school were from families with incomes of less than $3,000, compared with 18% in this income group for children in school.

Many of the children not in school may come from the families of migrant farm workers. For example, of the children not in school from the West, about 65% lived in homes where a foreign language was spoken, as contrasted with only 20% of the children in school from the West (Table 65). Also, 59% of the children not in school in the West had a foreign language problem noted by the NCHS test examiner, as contrasted with about 9% of the children in school. Also children out of school in the Northeast were noted to more often come from homes where a foreign language was spoken than did children in school in that region (34% compared to 12%).



*No observations in this group.

FIGURE 21 COMPARISON OF CHILDREN IN SCHOOL WITH CHILDREN NOT IN SCHOOL ON SELECTED DEMOGRAPHIC AND SOCIOECONOMIC VARIABLES

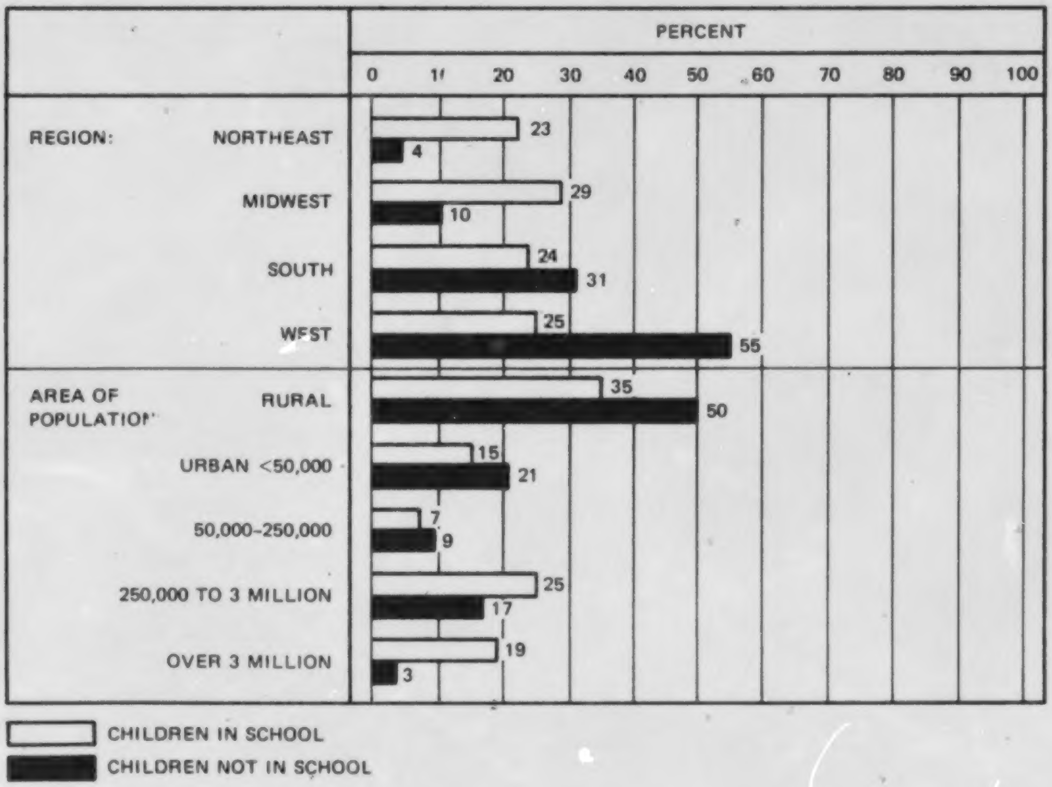


FIGURE 21 COMPARISON OF CHILDREN IN SCHOOL WITH CHILDREN NOT IN SCHOOL ON SELECTED DEMOGRAPHIC AND SOCIOECONOMIC VARIABLES (Concluded)

Table 65

FOREIGN LANGUAGE CHARACTERISTICS OF CHILDREN IN SCHOOL AND NOT IN SCHOOL BY REGION

Region	Parent Indicated That a Foreign Language is Spoken in the Home						A Foreign Language Problem Noted by the NCHS Psychological Test Examiner					
	Children in School				Children Not in School		Children in School				Children Not in School	
	With Data		Without Data				With Data		Without Data			
	%	N*	%	N*			%	N*	%	N*		
Total	10.4%	2363.2	6.9%	63.2	37.5%	68.4	2.7%	609.7	2.0%	18.7	33.9%	62.0
Northeast	12.4	636.8	9.4	20.1	33.8	2.6	1.9	96.5	3.3	7.1	33.8	2.6
Midwest	7.1	460.1	3.7	8.4	--†	--	0.1	8.5	--	--	--	--
South	2.3	126.2	--	--	--	--	0.3	16.8	--	--	--	--
West	20.3	1140.1	16.7	34.7	65.1	65.8	8.7	487.9	5.6	11.6	58.8	59.4

*Number in thousands.

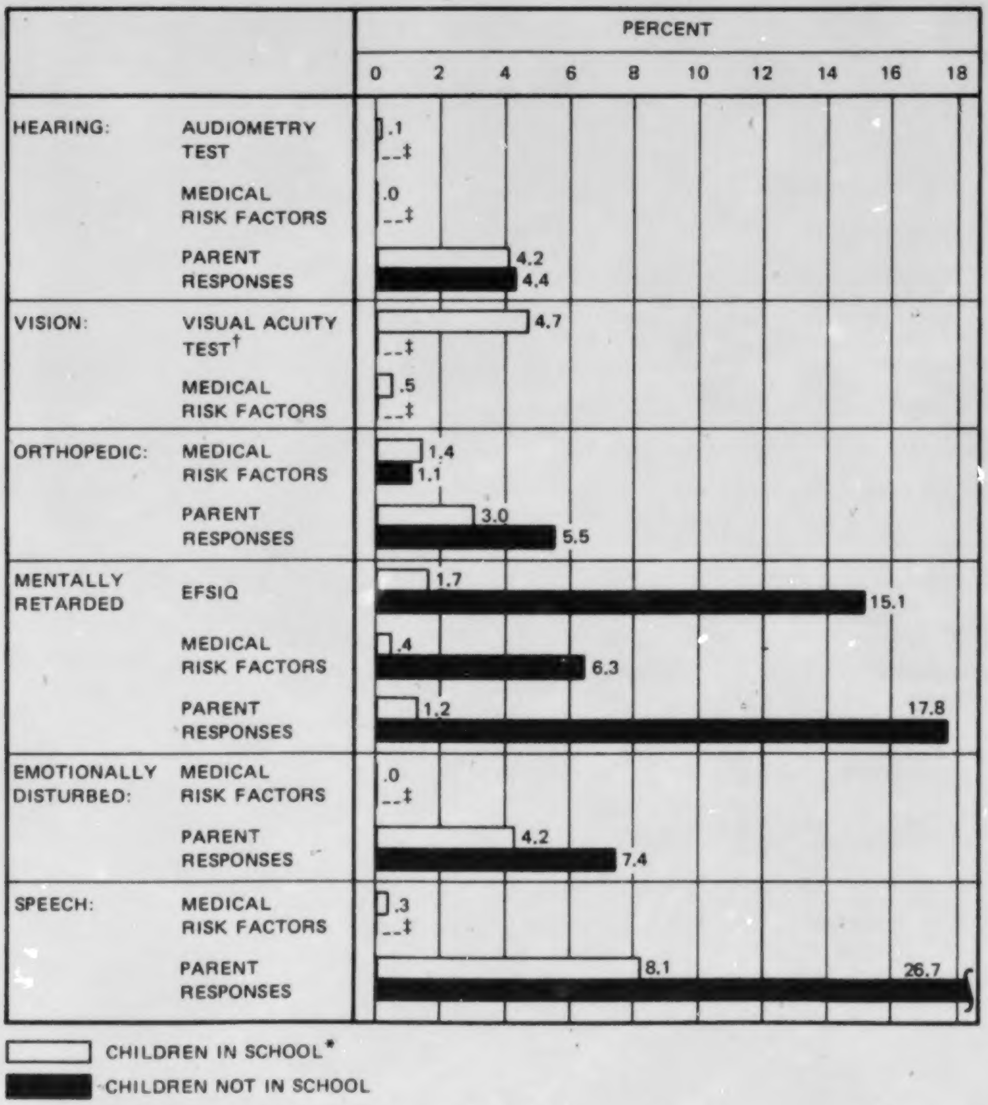
†No observations in category.

Figure 22 illustrates the difference in the number of children in school and not in school who were identified as possible candidates for special resources applying the indicators used in previous sections based on medical examinations, vision and hearing tests, achievement scores and EFSIQ as well as the parent-reported medical history. For the physical handicaps--hearing, vision, and orthopedic problems--the rates of identification for children out of school based on indicators appears to be comparable to the rates for children in school. However, for indicators of possible mental retardation, emotional disturbance, and speech problems the rates for children out of school are significantly higher than for children in school. For indications of possible mental retardation, the rates for children out of school is about 10 times as large as the rate for those in school using each of the three indicators applied in Section III (EFSIQ, medical risk factors, and parent response indicators).

With respect to emotional disturbance and speech handicaps, the medical examination identified few children either in school or out of school. Based, however, on the parent indicators, about four times as many children out of school were identified as children in school.

Conclusions

- Of all the children reported as not attending school, 85% were 6-year olds.
- Of the children not in school in the West, 65% came from homes where a foreign language was spoken compared with only 20% of the children in school from the West.
- Similarly, 34% of those not in school in the Northeast were from homes where a foreign language was spoken compared with only 12% of the children in school in the Northeast.
- Applying indicators and risk factors developed from these data, children out of school who may be potential candidates for services for the hearing and vision impaired or who may have orthopedic handicaps, were identified at rates comparable with those children in school.
- However, for those children out of school who were identified by indicators and risk factors as potential candidates for services for the mentally retarded, emotionally disturbed, and for speech therapy, there was a far higher rate of potential need than was found for children in school.



[*] Excludes children in school for whom no school data were available

[†] Moderate and severe levels, uncorrected visual acuity $\leq {}^{20}/_{70}$ or $\leq {}^{14}/_{70}$.

[‡] No observations in this group

FIGURE 22 RATES OF THE POTENTIAL NEED FOR SPECIAL RESOURCES FOR CHILDREN IN SCHOOL* AND CHILDREN NOT IN SCHOOL USING VARIOUS INDICATORS

VIII SUMMARY AND CONCLUSIONS

With the aid of consultants, sets of indicators were derived from NCHS data to explore the possible needs of children aged 6 through 11 years for special educational services for the handicapped. Needs examined in this report include services for the physically handicapped (hard of hearing, "sight-saving" for the visually handicapped, and orthopedically handicapped), special services for the mentally retarded and emotionally disturbed, speech therapy, special provisions for "slow learners," and multiple services in cases where teachers recommended more than one special service or provision.

The major findings for each of these groups of children are summarized below:

Hearing Handicapped

- Of the children using resources for the hearing handicapped only 5% were also identified as having a hearing loss by the audiometric test.
- Children identified only by the audiometric test appeared to have a higher incidence of parent-rated health and behavioral problems than those recommended only by the teacher.
- Children identified either by the hearing test or by the teacher had mean achievement test scores more than one standard deviation below the mean for children not so identified (although the differences were not statistically significant).
- Statistically significant differences were found across income and region of the country for children identified by the parent-response indicators. Children from low-income families and children from the South were more likely to be identified by parents as having trouble hearing.

Visually Handicapped

- More than 40% of the children recommended by teachers for special resources for "sight-saving" (services for the visually impaired) had a tested distance acuity of 20/20 or better.
- Half of the children using special resources for sight-saving had normal vision as measured by the visual acuity test.

- Children who were found to have moderate to severe loss of visual acuity (uncorrected) did not have health histories or school behaviors much different from children not identified by either the test or teacher.
- Children identified only by the teacher's recommendation of need for special resources did have a significantly greater incidence of poor health at one year of age and trouble with their eyes (not related to visual acuity), and were reported by their parents as being slower to learn than other children.
- Children identified by test and those identified by both test and teacher appeared to be achieving at or above the mean for children not identified by either indicator.
- Children identified only by teacher recommendation for services scored, on the average, somewhat below the mean on WRAT math and reading and EFSIQ.
- The most significant pattern across socioeconomic and demographic variables was an increase of identification rates based on the vision tests with increasing age.

Orthopedically Handicapped

- Children who were doubly identified (either by teacher and parent or teacher and medical findings) had health profiles indicating far more health problems than children not so identified.
- More Black than White children were identified from the parent indicators, but the same difference did not occur for either teacher recommendations or medical findings.
- More children 10-11 years old were identified than were younger children.
- Only children identified by both teacher recommendation and medical indicators were achieving below the mean on test scores, although the differences in scores were not statistically significant.

Mentally Retarded

- Of all children using resources for the mentally retarded, only 24% had EFSIQ scores of 69 or below (the threshold of retardation under the classification system of the American Association on Mental Deficiency).
- Children identified solely on the basis of the teachers recommendation for special resources for the mentally retarded had mean achievement scores in WRAT reading and math that were well below the mean for those not identified, but had mean EFSIQ scores above the 69-or-below thresholds of mental retardation used in this report.
- Children identified by at least two independent sets of indicators had a significantly higher incidence of health and behavior problems as reported by parents, had a high rate of school adjustment problems as reported by teachers, and had significantly lower mean

scores in WRAT reading and math achievement tests and lower mean EFSIQ scores than did children not identified by any indicator.

- Differences in identification patterns were found across socioeconomic variables. In each group of children identified as potential candidates for services for the mentally retarded, all except those identified by medical risk factors included Blacks at a significantly higher rate than Whites (see text in Section IV for discussion of this finding). In addition, boys were identified at significantly higher rates than were girls for teacher recommendations and parent responses but not for either medical risk factors or EFSIQ. Considering family income, children from families with an income of less than $3,000 were selected at higher rates on the basis of the EFSIQ than any other indicator. The pattern across income was consistent for each set of indicators--that is there was a continual decline in the rate of identification with increasing income levels.
- Differences in identification found across socioeconomic factors seemed to persist in the group of children who were actually receiving services for the mentally retarded. There was a higher rate of participation for: boys, Blacks, children from low-income families, and older children.

Emotionally Disturbed

- Medical risk factors used in this report identified only a single child in the sample and therefore were not used for comparison.
- Teachers recommended significantly more Black children than White, twice as many boys as girls, fewer 6 and 7 year olds than older children, and significantly more children from low-income than from high-income families as possible candidates for services for the emotionally disturbed.
- Children identified only from the parent responses did not have school behaviors much different from those children not identified by any indicator, although they did tend to have more health related problems such as late walking, trouble hearing and had been knocked unconscious at some point. On the other hand, children identified only by the teacher's recommendation for services for the emotionally disturbed tended to be less popular with their school playmates, were less attentive, more restless, and required more frequent disciplinary action than other children. This group also tended to score significantly lower on achievement tests and to have somewhat lower mean EFSIQ scores, although not low enough to fit the classification of mentally retarded.
- Although there was little overlap between sets of indicators in the identification of children who might be possible candidates for services for the emotionally disturbed, there was a consistent parallel pattern for each identification factor across income groups--the rate of identification in each case drops with

increasing income, suggesting that the kinds of behaviors teachers associate with emotional disturbance and the kinds of behavioral traits commonly associated with emotional disturbances (reflected in parent indicators) may have a strong relationship to socioeconomic and, by implication, environmental factors.

Speech Handicapped

- Of all children in speech therapy classes 51% were identified by the teacher's recommendation alone.
- Boys were identified at significantly higher rates by teachers and parents than were girls, but no apparent sex differences were found in the medical examination indicators.
- Children from low income families were identified at significantly higher rates by parent indicators and teacher recommendations but not medical factors.
- Children 6-7 years old were identified at significantly higher rates by both teachers and parents than were children 10-11 years old.
- Black parents reported their children had problems in talking almost twice as frequently as White parents.
- Differences across many demographic and socioeconomic variables were found to persist for children actually in speech therapy classes: boys, Blacks, and younger children (6-7 years old) were receiving services at higher rates than were girls, Whites, and older children.

Slow Learners

- Children recommended by teachers for services for the "slow learner" displayed far more disruptive and socially unacceptable school behaviors than children not so identified.
- More than 40% of the children identified as "slow learners" had not attended either nursery school or kindergarten.
- "Slow learners," as identified by the teacher, performed significantly below the mean in reading and math and on EFSIQ tests but did not score low enough on the EFSIQ to be classified as mentally retarded.
- A significantly higher proportion of Black children, boys, and children from low-income families were identified by teachers as "slow learners." However, only boys and children from low-income families were receiving services for the "slow learner" at a higher rate.

Multiple Handicaps

- Of all the children recommended by teachers for special resources, approximately 880,000, or 3.9%, were recommended for two or more resources.

- Children most often recommended for multiple services were those identified as hearing impaired and those recommended for classes for the mentally retarded.

Children Not in School

- Of all the children reported as not attending school (only 0.8% of the total population), 85% were 6 year olds.
- Of the children not in school in the West, 65% came from homes where a foreign language was spoken compared with only 20% of the children in school from the West. Similarly, 34% of those not in school in the Northeast were from homes where a foreign language was spoken compared with only 12% of the children in school in the Northeast.

One of the most consistent findings in this report is the lack of overlap or agreement between various sets of indicators selected to identify potential candidates for special educational resources. However, in comparing children across indicator sets with those not identified by any indicator, several distinctive populations were found. For example, children identified for speech therapy classes either by the teacher's recommendation or by the parent indicator were distinct in their behavior profiles from children not so identified--they appeared to be more socially disruptive in school than were other children. In other cases, children identified only from the set of parent-response indicators as possible candidates for services often tended to have profiles more like children not identified by any indicator than did those identified only by the teachers recommendation or those identified by two sources. For example, children identified from the parent responses as being possible candidates for services for the mentally retarded were more like children not identified as possible candidates than they were like children identified by both teacher recommendations and parents, or by the teachers recommendation and their EFSIQ score.

The findings of this report point to the difficulty in using any single piece of information about a child as a predictor of need for special resources as well as the difficulty in obtaining consensus even when extensive information is available. For example, in the case of children recommended for special classes for the mentally retarded, many children recommended by teachers for such services had EFSIQ scores above 69 (the threshold for mental retardation used in this report) while many children with scores below 69 were not recommended for services. Thus, in terms of the findings of this report, a child's IQ score does not appear to have a particularly significant impact on whether or not a child is recommended for services for the mentally retarded. In general, what appears to have distinguished those for whom teachers recommended some kind of special service (whatever it may have been) from those for whom teachers did not recommend it was classroom behavior and performance. That is, children recommended for a special resource were more frequently rated by the teachers as intellectually below average and were indicated as having somewhat disruptive behavior in the classroom or as being unpopular with their peers. On the other hand, what appears to distinguish children identified by a source other than the teacher as a potential candidate for a particular service is a slightly higher incidence of ill health or slow development. Thus, on the basis of these findings it is more likely that an actively disruptive child will be recommended for services than will a passive child.

In addition, for children identified as possible candidates for services for emotional disturbance, mental retardation and resources for the "slow learner," there tended to be a much higher rate of identification among children from families of very low incomes. For children identified as requiring speech therapy, there is a consistent downward trend in rates of identification across age. Both of these findings suggest that the likely incidence of these conditions may occur differentially across age and income groups.

It is clear from these findings that teachers have identified groups of children who are distinct from the average child in their classroom. Those children identified by the teacher consistently appear to be performing somewhat below other children not singled out for services. Thus, teachers have made an educational diagnosis on the basis of the need for some special education service that they themselves cannot supply. However, it is not at all clear that children recommended for special services by teachers actually require services for the handicapped as intended by the legislation. Moreover, for many children actually receiving services for the handicapped from the NCHS data, it was difficult to identify a specific handicapping condition other than the fact that children in special classes were often performing below the mean compared with children not receiving special services. That is, using indicators of need such as loss of hearing or vision, low estimated IQ, and other indicators of possible need as defined in this report, only about half of the children actually receiving services were found to have conditions serious enough to be identified by these indicators.

The findings from this study suggest that the estimated need for special services for the handicapped is highly dependent upon definitions and expectations and thus the target population can fluctuate dramatically depending upon definitions applied. If the intent is to serve only the most severely handicapped, then definitions can be narrowly applied and the target population will be quite small. However, as the definitions expand to include more categories of handicaps and levels of severity, the target population can also be expected to expand somewhat uncontrollably. The lack of control comes from the fact that definitions become ambiguous and all inclusive.

Since there is little agreement on the population base to which estimates should be applied there is wide state-to-state variation in the potential number of children who may be candidates for special classes for the handicapped. That is, it is important to know whether estimates of need should be applied across all age groups equally, and whether they should be applied to all children between the ages of 1-21, or only to the school age population of 5-17. Using different population bases will produce quite different target populations. This suggests a strong need to refine the current classification scheme used to define the handicapped population in order to clarify the kinds of children that are to be served under this new Federal legislation. This is an essential task in assuring comparability of identification across states as well as to aid in the successful implementation, monitoring, and enforcement of P.L. 94-142.

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Appendix A

METHODOLOGY

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Data Source

The source of data for this study of handicapped children was Cycle II of the Health Examination Survey conducted between July 1963 and December 1965, by the National Center for Health Statistics (NCHS). The survey design corresponded to a multistage, stratified, probability sample of 7,417 children between 6 and 11 years of age from the noninstitutionalized population of the United States, excluding Hawaii and Alaska. It represented about 24 million children in the total population at that time. The sample contained approximately 1,000 individuals in each age cohort.

Information was obtained by means of medical and dental examinations; psychological, visual, and hearing tests; school and household adult questionnaires; anthropometric measurements; and birth certificates. Descriptions of these sources and the survey procedures are contained in Appendix B.

The Integrated Data Tape File for Cycle II was used to generate the tabulations for Volume II. This file contains the major data elements obtained or derived from the survey for the 7,119 children who were examined, 96% of those sampled. The file also includes the weights needed to derive estimates from the sample data. The weights include a factor reflecting the probability of selection, an adjustment for nonresponse cases, and a poststratified ratio adjustment. The last factor has the effect of adjusting the population estimates to agree with independent figures prepared by the Bureau of the Census by color and sex within single year of age.

Comprehensive descriptions of the survey plan, sample design, examination content, and file documentation are available from NCHS (NCHS, October 1967; NCHS, September 1969; NCHS, May 1975). Questions of reliability and nonresponse are discussed in "Plan Operation and Response Results of a Program of Children's Examinations," Series 1, No. 5 (October 1967). Nonresponse bias is also discussed on pages 10 and 11 of Section II.

Computation of Means and Frequencies

Means, frequencies, and other tabulations were generated using the weights provided on the Integrated Data Tape File. If X_i is the value of a variable of interest for individual i, and W_i is the value of the sampling weight associated with the same individual, then the estimate of the mean $(\bar{X})$ for some group of individuals is:

$$\bar{X} = \frac{\sum_{i \in I} X_i \cdot W_i}{\sum_{i \in I} W_i}$$

where I is the set of indexes of children in the group.

Computation of the Standard Errors

For a complex survey design such as that used in the NCHS Cycle II survey, the calculation of standard errors of estimates is not trivial. The use of cluster and multistage sampling, and adjustments for post-stratification and nonresponse make it impossible to develop a complete algebraic solution for the estimation of sampling errors.

A balanced half-sample replication technique called pseudoreplication used by NCHS was also employed in the current EPRC study to compute standard errors. The details of the technique are described in a number of references (Kish and Frankel, 1974; Kish and Frankel, 1970; NCHS, Series 2, No. 31, 1969; NCHS, Series 2, No. 14, 1966).

The technique consists of systematically selecting a number of subsamples from the original sample. Each subsample is called a half-sample replicate. Assume that a parameter p is of interest. For the development of the theory, the estimate of p is required to be a linear function of the sample observations, but a number of empirical studies have indicated that the technique may also be applied to ratio estimators and correlation statistics with a resulting bias that is unimportant.

Estimates can be derived for each half-sample replicate and for the entire sample. Let $\hat{p}_i$ be the estimator of p in the ith half-sample replicate and let $\hat{p}$ be the estimator of p for the entire population. Then the variance of the estimator is calculated as:

$$S_p^2 = \frac{1}{K}\sum_{i=1}^{K} (\hat{p}_i - \hat{p})^2$$

where K is the total number of half-sample replicates. The standard error of $\hat{p}$ is the square root of S_p^2:

$$S.E.\hat{p} = \sqrt{S_p^2} \quad .$$

Twenty half-sample replicates had been developed by NCHS. In addition to the NCHS Cycle II Integrated Data Tape File, EPRC obtained the corresponding file of Cycle II Pseudoreplication Weights. This file consisted of 21 weights for each child: the total sample weight plus a weight corresponding to each replicate. A program was written at SRI to generate the estimates and standard errors of interest to the EPRC study of the handicapped. Selected means and standard errors generated by the SRI program were compared with means and standard errors generated by NCHS to verify that the standard errors were being calculated correctly.

The NCHS survey design and operation of each cycle was organized to minimize measurement bias and variability on data collected from the physical exam and the vision and hearing tests. The estimates of standard errors for these items are primarily measures of sampling variability, but they also partially reflect the variability arising from the measurement process.

It should also be noted that the magnitudes of the standard errors depend on the variation in the total population and on the survey design. As a result, the standard errors are related to, but are not identical to, the standard errors that would have been generated had a simple random sample been taken.

Statistical Tests

In the present study, statistical tests were conducted to examine: (1) differences in rates of identification across demographic and socioeconomic groups based on the application of various indicators of potential handicapping conditions, (2) differences in mean achievement and mean EFSIQ test results, and (3) differences in rates of school behaviors for groups identified by various combinations of indicators as possibly handicapped. Statistical tests aid the researcher in evaluating the extent to which differences based on sample findings reflect true differences in the total population as opposed to differences that could arise from fluctuations due to sampling bias.

In order to test the significance of differential rates, the Bonferroni technique of multiple pairwise comparisons was used. This technique permits the researcher to test for differences in rates among several groups while controlling the overall level of significance (Miller, 1966).

The technique as applied in this study consisted of computing Z scores for each pair of groups from a designated set. The Z scores were calculated as follows:

$$Z = \frac{r_1 - r_2}{\sqrt{SE_1 + SE_2}}$$

where r_1 and r_2 are the rates for groups 1 and 2 in a particular pairwise comparison and SE_1 and SE_2 are the corresponding standard errors of those rates.

The Bonferroni technique consists of determining the critical value for testing each difference so that the overall significance level is less than a specified value, α. Table A-1 shows the critical Z values for significance at the 0.05 level based on the number of pairwise comparisons to be tested for a particular set. For instance, to test the significance of differential rates of identification across income, fifteen pairwise comparisons (six income groups taken two at a time) were tested. Likewise, for differences in mean test scores and in rates of school behaviors, four groups were tested: (1) group identified only by indicator set A; (2) group identified only by indicator set B; (3) group identified by both indicator sets A and B; and (4) group not identified by either indicator set A or B. A total of six pairwise comparisons resulted from analyses of these groups. A difference between rates was considered statistically significant if the calculated Z score was equal to or greater than the critical Z value for the appropriate number of pairwise comparisons as shown in Table A-1.

Table A-1

CRITICAL Z SCORES BASED ON THE NUMBER OF MULTIPLE PAIRWISE COMPARISONS FOR BONFERRONI TESTS OF SIGNIFICANCE

α	α/2	Number of Groups for Comparison	Number of Pairwise Comparisons (k)	α/2k	Critical Z Score [Z(α/2k)]
.05	.025	2	1	.025	1.96
		3	3	.00833	2.39
		4	6	.00417	2.63
		5	10	.00250	2.81
		6	15	.00167	2.93

In some cases the number of children in a particular group was considered to be too small to permit inclusion of that group in multiple comparisons. When fewer than six children were in any group, that group was excluded from statistical testing. Also, in many cases the rates displayed for a particular group are extremely low and the corresponding standard errors are several times larger than the estimated rates. In such cases, the rates themselves are of little value, except that they indicate that the true rates are probably small. Extreme caution should be exercised in dealing with these low rates.

Tables C-1 to C-9 in Appendix C present the results of tests of significance. Standard errors and tests of significance were not generated for home behaviors and health history profiles and for the school behaviors of children identified by medical risk factors because of the expense associated with the pseudoreplication technique required to generate standard errors with the NCHS data.

Data Processing

All data processing was carried out on the CDC 6400 at SRI. Preliminary tabulations were generated using SPSS (Statistical Package for the Social Sciences), Version 6.0. This package has the capability of generating descriptive statistics on weighted data. It does not have the capability, however, of efficiently generating the standard errors. Therefore, a program was developed at SRI that computed standard errors using the replication weights provided by NCHS.

Other Methodological Consideration

The categories of special resources listed in the NCHS school questionnaire included hard of hearing, "sight saving" (sic, interpreted as vision), orthopedic, "slow learner," mentally retarded, emotionally disturbed, and other. Approximately 4% of the children for whom a school questionnaire was available were identified as needing "other" resources. Although the questionnaire included space to specify the "other" resources, information regarding those resources was not available either on the data file or from NCHS. In the absence of such information this category of special resource was dropped from further study.

Of the total population of school children who had school data, about 73% were not recommended for any resource, 23% were recommended for exactly one resource, and 4% were recommended for two or more special resources. These figures exclude the "other" category. Each child was included in each resource category recommended in the analysis of individual handicaps. For physical handicaps (vision, hearing, and orthopedic) a child was included as needing the resource only once, even if more than one resource was recommended. For more details on those recommended for more than one resource, see Section VI.

Appendix B

SOURCES OF INFORMATION IN THE NCHS DATA BASE

Appendix B

SOURCES OF INFORMATION IN THE NCHS DATA BASE

NCHS administered a number of questionnaires and tests to obtain data on each child in the sample. This appendix presents a general description of each source of information and its use in this report. The reader should consult NCHS publication Series 1, No. 5, "Plan Operation, and Response Results of a Program of Children's Examinations" (October 1967) for a complete copy of each questionnaire and a detailed description of test administration.

School Questionnaire

For each child in the NCHS survey whose parent reported attendance at school a school questionnaire was administered. The school principal was given the questionnaire and asked to have it filled out by the child's teacher or a person whom the principal believed to be the most informed respondent. In cases where schools were visited during summer months, the questionnaire was mailed early in the fall with the request that it be completed and returned. If the questionnaire was not received in a reasonable amount of time a mail follow-up was made.

School information is available for approximately 95% of the total sample of children. Of the children reported to be in school, school data were received from 96.2%. These children attended public, private, or parochial schools. Children in institutional schools such as hospital schools or day care facilities were not included in the NCHS survey. The purposes of collecting school data were to verify information from the parent such as grade placement and, more importantly, to document a major portion of a child's life--the schooling experience. Types of information used in this study include: teacher's perceived need for special education resources; school behavior; and perceived academic and intellectual performance.

Household Questionnaire

A household interview questionnaire was one of three instruments used to collect data from parent sources. This questionnaire was used during the final stages of the sampling process to locate children in the eligible age range. The first section of the form asked questions related to the age of children in the household. If no children between the ages of 6 and 11 were present in the household, the interview was concluded. Where eligible children were present, detailed information concerning other members of the household, family income, and demographic characteristics was noted by the interviewer. The household interviewer then left a medical history questionnaire, a self-administered form, with the parent or guardian of the child.

Population profile characteristics used in this study to examine demographic and socioeconomic differences among groups of children were supplied by this interview and questionnaire. Definitions* of these variables are as follows:

> Race--The NCHS survey tabulated three categories of race: "Negro," "White," and "other." They were defined as follows:
>
> > Negro--Negroes and persons of mixed Negro and other parentage.
> >
> > Other--American Indians, Chinese, Japanese, and all races not "White" or "Negro."
> >
> > White--Caucasians, Mexicans.
>
> Because the sample of "other" was very small (0.4%) and because it was not possible to separate persons of Mexican descent from Caucasians in the "White" category, this study considered only two categories of race:
>
> > Black ("Negro")
> > White ("White" and "other").
>
> Age--The final survey sample was selected from the group of children located by a preliminary household interview in predetermined sample areas. Children between ages 6 and 11 years old inclusive at the time of the interview were included in the group. A few children (72) who were 11 years old at the time of the interview turned 12 before the actual examination, 2 to 3 weeks later. In analyses by NCHS as well as in this study, these children were included in the 11 year-old group.

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*Definitions in this section are taken from "Intellectual Maturity of Children, Demographic and Socioeconomic Factors--United States," NCHS publication Series 11, No. 116, pp. 73-74.

Family Income--Family income included "the total income received during the past 12 months by the head of the household and all other household members related to the head by blood, marriage or adoption." The gross cash income was recorded, except when a family owned its own farm or business, when net income was recorded.

The six levels included in this study were:

Less than $3,000
$3,000-$4,999
$5,000-$6,999
$7,000-$9,999
$10,000-$14,999
$15,000 and over

Geographic Region--The regional classification corresponded to the Bureau of the Census partition of the country in four areas. The states included in each region are as follows:

Northeast--Maine, Vermont, New Hampshire, Massachusetts, Connecticut, Rhode Island, New York, New Jersey, and Pennsylvania.

Midwest--Ohio, Illinois, Indiana, Michigan, Wisconsin, Minnesota, Iowa, and Missouri.

South--Delaware, Maryland, District of Columbia, West Virginia, Virginia, Kentucky, Tennessee, North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, and Arkansas.

West--Washington, Oregon, California, Nevada, New Mexico, Arizona, Texas, Oklahoma, Kansas, Nebraska, North Dakota, South Dakota, Idaho, Utah, Colorado, Montana, Wyoming, Alaska, and Hawaii.

Type of Place--The place categories were defined by the location of the residence in a rural or urban area and by the size of the population in those areas. The definitions were the same as those used in the 1960 census.

The urban population consists of persons living in urbanized areas, persons living in places of 2,500 inhabitants or more, and persons living in towns in New England or counties outside of New England with certain specified density requirements. The population not in an urban area was considered rural.

The five type-of-place classifications included in this analysis were:

Rural	Under 50,000 people
Urban	50,000-250,000 people
	250,000-3,000,000 people
	Over 3 million people

Medical History Questionnaire

Medical history data on the child was collected from the parent in two different ways. The first was a self-administered questionnaire and the second was an interview. These two instruments as well as the household interview covered all data collected from parent sources. The medical history questionnaire, designed to be self-administered, was left with the parent at the conclusion of the household interview. Later an HES interviewer picked up the Medical History form, helping parents complete it when necessary and reviewing and clarifying any contradictory or confusing responses. This activity served to verify parent responses and assure a high rate of response. Also, at this visit the HES interviewer questioned the parent about several subjects which were thought to require special handling through personal inquiry. This interview information was collected on the Medical History form.

Information from the Medical History questionnaire was used extensively in this study both to develop parent indicators of possible handicapping conditions and to profile early health characteristics of various groups of children.

Birth Certificate

Further information regarding the child's medical history was obtained from a birth certificate. Birth certificate information was collected for 94% of the sample children. Birth certificate information was used, in addition to medical history information from the parent, to profile early health characteristics of the children.

Physical Examination

The physical examination was conducted from a mobile examination center by a physician specially prepared to conduct the standardized aspects of the examination and to pursue any evidence of abnormality through further investigative techniques. The physician reviewed the Medical History Questionnaire prior to examination, and noted any special circumstances that might affect the examination. The standardized examination covered specific areas; once covered the physician was free to pursue particular findings as he judged appropriate. The examination included general inspection, examination of joints and muscles and neurological examination, eye examination, ear, nose and throat examination, and cardiovascular examination.

The general inspection included observation of tics or mannerisms, physical deformities, general appearance, gait, evidence of finger sucking or nail biting, breast development, and presence of axillary hair.

For the joints and muscles examination the examinee performed various specified movements and the physician noted any abnormalities. Additional procedures were introduced when appropriate.

With regard to the eye examination, the physician conducted careful inspection for evidence of styes, conjunctivitis, blepharitis, nystagmus, ptosis, and strabismus. The Hirschberg's method, the moving light test and the cover test were used to test for strabismus.

The ear, nose and throat examination included evaluation of the condition of the drum, auditory canal, and external ear, and inspection of the oral pharynx, tonsils, and nose. The physician was provided with a Welch Allyn pneumatic otoscope, and a Siegle's otoscope and headlight and was given special training in their use.

The physician conducted a cardiovascular examination by listening for and recording a detailed description of the heart sounds including innocent as well as significant murmurs and by recording a phonocardiogram and a 10-lead electrocardiogram. Two blood pressure readings were also taken by the nurse.

Dental Examination

A standardized dental examination was conducted by an HES survey dentist, however the results of this examination were not part of this study.

Vision Examination

HES operational constraints made it necessary for the vision examination to be conducted by the HES survey dentist who was given the necessary optical training to become adept at administering the test. The vision examination included tests for color vision (conducted with glasses worn) and for normal vision (conducted without glasses worn). Results of the color vision examination were not used in this study. A commercial instrument called the Master Orthorater was used to test visual acuity for children who could read letters. Special wall charts for distance and cards for near vision with Landolt ring symbols were used for children who could not read. The normal vision examination involved tests for monocular and binocular visual acuity at near and far distances (Bausch & Lomb Orthorater instrument with special Armed Forces plates supplemented by Landolt ring charts for illiterates), tests for distance and near lateral phoria and for distant vertical phoria, a test for accommodation (diopter test), and tests for binocularity (orthorater plates and "Worth 4-dot" tests).

Hearing Examination

Audiometric testing was conducted for each child in the survey by a specially trained technician in a specially constructed soundproof room. Each child was tested at eight different frequencies and the 4000-4,000-Hz frequency was repeated a second time. These audiometric examination findings represent the first study that is representative of hearing levels in the elementary school-age population in the United States and are in close agreement with other rigorous studies of hearing levels of young adults. For example, median hearing levels from these data differ by no more than 1.5 decibels from those of the 18-24 year old population surveyed in the NCHS 1960-1962 Health Examination Survey. Such a small difference could easily be attributed to sampling errors alone. These findings also agree with a study of 4,078 children between the ages of 5-14 in Pittsburgh, Pennsylvania in public and private schools conducted in 1958-1960.* Differences between the Pittsburgh and NCHS study range from 0.5 to 4 decibels, depending on frequency. The rates based on audiometric findings are also confirmed by Jerome D. Schein and Marcus T. Delk, Jr. in a comprehensive evaluation of hearing titled, the Deaf Population of the United States, 1974.

Other Tests and Measurements

Trained technicians carried out the following additional tests and measurements during the child's examination at the mobile unit: X-rays of chest, hand and wrist, measurements of height and weight, spirometry, grip strength test, body measurements, including skinfold thickness, and an exercise tolerance test. These data were not used in the present study.

Psychological Testing

A battery of psychological tests were administered to each child during his/her visit to the mobile examination unit. They included the vocabulary and block design subtests of the Wechsler Intelligence Scale for Children (1949), reading and arithmetic sections of the Wide Range Achievement Tests (1963), and the Harris-Goddenough Draw-A-Person Test (DAP). A subsample of approximately 2,000 children in the NCHS survey were also administered the 5-card version of the Thematic Apperception Test (TAT). For further information regarding the administration of these tests the reader is referred to NCHS publications Series 1, Number 5 "Plan, Operation and Response Results of a Program of Children's Examinations"; Series 2, Number 15 "Evaluation of Psychological Measures Used in the Health Examination Survey of Children, Ages 6-11"; and Series 2, Number 58 "Language and Adjustment Scales for the Thematic Apperception Test for Children 6-11 Years."

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*Pittsburgh study: E. L. Eagles, S. Wishik, L. G. Doerfler, W. Melnick, and H. S. Levine, "Hearing Sensitivity and Related Factors in Children," The Laryngoscope, June 1963; and NCHS: Hearing Levels of Adults by Age and Sex, United States, 1960-1962, Vital and Health Statistics, PHS Pub. No.-1000, Series 11, No. 11, Public Health Service, Washington, U.S. GPO, October 1965.

NCHS conducted an exploratory study of the usefulness of the TAT as a measure of behavior. It was found that the TAT could not be validated as a measure of personality due to the lack of criteria measuring personality in the NCHS survey. Results of the TAT were not used in the present study.

The Harris-Goodenough Draw-A-Person Test is widely used as a quick method of testing intelligence. The test has been found to correlate well with other measures of verbal and motor development such as the Stanford-Binet. As a measure of personality, however, the DAP is not considered useful. For instance, it is highly sensitive to cultural influences. Because more reliable measures of intellectual ability were available in the NCHS survey and because it is not appropriate to use the drawings in diagnosing personality qualities in individual cases, the present study did not make use of the DAP test measurements.

The battery of psychological tests was administered by psychologists with at least masters-degree level training and experience in administering tests to children. The testing session for each child lasts approximately 1 hour. For each test, the examiner followed instructions outlined by the text manual or instruction booklet.

Wechsler Intelligence Scale for Children (WISC)

Since early in this century, it has been common practice to compare the performances of large numbers of children on a variety of school-related tasks, to determine where any child stands in relation to his/her agemates. These standardized sets of tasks, commonly called intelligence tests are most useful as predictors of school performance. They measure not only the various aspects of intellectual capacity, but also tap into personality traits that affect a child's academic achievement, such as energy level, persistence, and willingness to conform to expectations.

One of the most widely used tests, for both applied and research purposes, is the Wechsler Intelligence Scale for Children; the WISC has the advantage of being divided into a number of separate subtests, each one tapping a different set of abilities. The NCHS survey administered two of the WISC subtests (Vocabulary and Block Design), in addition to other psychological tests, to each child. The decision to use only two subtests of the entire WISC battery was based largely on time and administrative constraints.

The Vocabulary subtest, in which the child is given a series of words and asked to define them orally, has the highest correlation with the full-scale IQ (the total IQ score based on all 12 subtests); it is therefore the single best subtest to administer in order to estimate IQ without giving the full WISC. It taps factors related to overall learning, both academic and intellectual, and reflects to some extent the degree of social and intellectual stimulation to which the child has been exposed.

The other subtest used in the NCHS survey, the Block Design, is a visual motor task requiring the ability to conceptualize. The child is given a set of colored blocks and asked to use them in matching a series of abstract patterns within a time limit. It is regarded as a nonverbal test of verbal conceptual abilities. Of the set of performance (as distinguished from verbal) subtests, Block Design is the most highly correlated with full-scale IQ.

An evaluation of the use of these subtests as the basis for estimating full-scale IQ of children aged 6-11 was conducted for NCHS by Mercer and Smith* using a sample of approximately 1,300 children aged 6-11 attending public elementary schools in Riverside, California during the school year 1967-68. They concluded that no other dyad of tests from the WISC would have produced better overall predictions of full-scale IQ in the Riverside sample and that therefore the use of the Vocabulary and Block Design subtests in the NCHS survey was justified.

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*National Center for Health Statistics, "Subtest Estimates of the WISC Full-Scale IQs for Children," Series 2, Number 47, Government Printing Office, Washington, D.C. (March 1972).

As reported in the WISC manual,* the WISC instrument used in NCHS survey, was standardized on a total sample of 2,200 cases, including 100 White boys and 100 White girls at each age from 5 to 15 years. Therefore, the 1949 WISC norms do not apply to Black children. However, subsequent revision of the WISC in the early 1970s† again based on a sample smaller than that of the NCHS survey, did include Black children in the standardization process. This revision did not substantially change the overall mean of the test and therefore the comparisons used in this report, based on group means, may still be considered valid.

For further discussion of the WISC and its application in the NCHS survey, see NCHS publication "Evaluation of Psychological Measures Used in the Health Examination of Children, Ages 6 11," Series 2, Number 15.

Wide Range Achievement Test (WRAT)

This instrument is another widely used, well-standardized test, that gives a quick measure of an individual's achievement level in reading, arithmetic, and spelling. The NCHS survey utilized the Reading and Arithmetic subtests of the 1963 revision of the WRAT. In his review of the psychological measures used in the NCHS survey, Dr. S. B. Sells concluded that inadequate research on the 1963 edition of the WRAT raises doubts as to the validity of the normative score levels. Dr. Sells strongly recommended a complete restandardization of the Reading and Arithmetic subtests using the entire NCHS sample. This task was accomplished. The NCHS standardization was based on a sample nearly twice as large at each 6-month age interval as the original WRAT standardization sample. The present study uses WRAT results based on the Health Examination Survey standardization. For a comparison of the NCHS WRAT standardization data and the official WRAT standardization data the reader is referred to NCHS publication "School Achievement of Children 6-11 Years as Measured by the Reading and Arithmetic Subtests of the Wide Range Achievement Test," Series 11, Number 103.

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*D. Wechsler, Manual for the Wechsler Intelligence Scale for Children, The Psychological Corporation, New York, 1949.

†D. Wechsler, Manual for the Wechsler Intelligence Scale for Children, The Psychological Corporation, New York, 1974.

Appendix C

TESTS OF STATISTICAL SIGNIFICANCE

The following tables present the results of tests of significance for: (1) rates of identification across demographic and socioeconomic groups; (2) mean achievement and mean EFSIQ scores of groups identified by sets of indicators; and (3) school behavior profiles of groups identified by sets of indicators. As explained in Appendix A, tests of significance were performed for each pairwise combination in the group under examination. That is, to test the significance of differential rates of identification across income groups based on a particular handicapping indicator, 15 pairwise combinations were tested (i.e., six income groups, taken two at a time). For significance tests on mean achievement, mean EFSIQ, and behavior profiles of children, the groups to be tested in various pairwise combinations were: Group identified only by indicator set A; group identified only by indicator set B; group identified by both indicator sets A and B; and group not identified by either indicator set. Thus for each behavior variable or mean test score six pairwise comparisons were tested.

Tables in this appendix present significant results by pair combination and indicate the direction of significance. Each table here corresponds to a table in the body of the report where rates and standard errors are presented.

Because of the expense and complexity of the pseudoreplication technique required to generate standard errors for these data, tests of significance were not performed for home behavior and health profiles or for the school behaviors of children identified by medical risk factors.

Table C-1

SIGNIFICANT DIFFERENCES IN SCHOOL BEHAVIORS FOR CHILDREN IDENTIFIED AS POSSIBLY HEARING, VISION OR ORTHOPEDICALLY IMPAIRED USING VARIOUS INDICATORS

(Overall Siginificance Level = .05)
(See Tables 8, 14, 21; Section III)

	Significant Pairwise Comparisons (Z Score)			
	Hearing Handicapped[*]	Vision Handicapped	Orthopedically Handicapped	
School Behaviors (Rated by the teacher)	Teacher or Audiometric Test[**]	Teacher or Visual Acuity Test[†]	Teacher or Parent Responses[‡]	Teacher or Medical Risk Factors[§]
Less attentive than most for his/her age	No significant results[††]	Neither teacher nor test > Both Teacher and test (2.95)	No significant results	No significant results
Extremely restless for his/her age	No significant results	No significant results	No significant results	No significant results
Intellectual ability clearly below average (bottom 25%) for his/her age	Teacher only > Neither teacher nor test (3.17)	No significant results	No significant results	No significant results

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[*] Comparison of children identified as possibly hearing handicapped from teacher recommendation with those identified by the audiometry test and those not identified:

Teacher only = identified only by teacher recommendation
Test only = identified only by the audiometry test
Both teacher and test = identified by teacher recommendation and by audiometric test
Neither teacher nor test = not identified by either teacher recommendation or by audiometric test.

[†] Comparison of children identified as possibly visually handicapped from teacher recommendation with those identified by the vision test (uncorrected visual acuity ≤20/200 or ≤14/140) and those not identified:

Teacher only = identified only by teacher recommendation
Test only = identified only by the vision test
Both teacher and test = identified by teacher recommendation and by vision test
Neither teacher nor test = not identified by either teacher recommendation or by vision test.

[‡] Comparison of children identified as possibly orthopedically handicapped from teacher recommendation with those identified by parent responses and those not identified:

Teacher only = identified only by teacher recommendation
Parent only = identified only by parent responses
Both teacher and parent = identified by teacher recommendation and by parent responses
Neither teacher nor parent = not identified by either teacher recommendation or by parent responses.

[§] Comparison of children identified as possibly orthopedically handicapped from teacher recommendation with those identified by medical risk factors and those not identified:

Teacher only = identified only by teacher recommendation
Medical only = identified only by medical risk factors
Both teacher and medical = identified by teacher recommendation and by medical risk factors
Neither teacher nor medical = not identified by either teacher recommendation or by medical risk factors.

[**] The group identified by both teacher and audiometric test was too small to permit generalization.

[††] No significant results = no pairwise comparisons were found to be statistically significant at the .05 level.

Table C-2

SIGNIFICANT DIFFERENCES IN MEAN ACHIEVEMENT AND MEAN EFSIQ SCORES FOR CHILDREN IDENTIFIED AS POSSIBLY HEARING, VISION, OR ORTHOPEDICALLY IMPAIRED USING VARIOUS INDICATORS

(Overall significance level = .05)
(See Tables 9, 15, 22; Section III)

	Significant Pairwise Comparisons (Z Score)				
	Hearing Handicaps		Vision Handicaps	Orthopedic Handicaps	
	Teacher or Audiometry Test[*] [††]	Teacher or Parent Responses[†]	Teacher or Vision Test[‡]	Teacher or Parent Responses[§]	Teacher or Medical Risk Factors[**]
Mean Achievement Scores					
Mean WRAT Reading	Teacher only > Test only (3.76) Neither > Test only (5.67)	No significant results[‡‡]	Test only > Teacher only (3.70) Test only > Neither (4.16)	No significant results	No significant results
Mean WRAT Math	Teacher only > Test only (3.71) Neither > Test only (4.82)	Neither > Test only (2.64)	Test only > Teacher only (3.69)	No significant results	No significant results

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[*] Comparison of children identified as possibly hearing handicapped from teacher recommendation with those identified by the audiometry test and those not identified;
Teacher only = identified only by teacher recommendation
Test only = identified only by the audiometry test
Both teacher and test = identified by teacher recommendation and by audiometric test
Neither teacher nor test = not identified by either teacher recommendation or by audiometric test.

[†] Comparison of children identified as possibly hearing handicapped from teacher recommendation with those identified by parent responses and those not identified:
Teacher only = identified only by teacher recommendation
Parent only = identified only by parent responses
Both teacher and parent = identified by teacher recommendation and by parent responses
Neither teacher nor parent = not identified by either teacher recommendation or by parent responses.

[‡] Comparison of children identified as possibly visually handicapped from teacher recommendation with those identified by the vision test (uncorrected visual acuity ≤20/200 or ≤14/140) and those not identified:
Teacher only = identified only by teacher recommendation
Test only = identified only by the vision test
Both teacher and test = identified by teacher recommendation and by vision test
Neither teacher nor test = not identified by either teacher recommendation or by vision test.

[§] Comparison of children identified as possibly orthopedically handicapped from teacher recommendation with those identified by parent responses and those not identified:
Teacher only = identified only by teacher recommendation
Parent only = identified only by parent responses
Both teacher and parent = identified by teacher recommendation and by parent responses
Neither teacher nor parent = not identified by either teacher recommendation or by parent responses.

[**] Comparison of children identified as possibly orthopedically handicapped from teacher recommendation with those identified by medical risk factors and those not identified:
Teacher only = identified only by teacher recommendation
Medical only = identified only by medical risk factors
Both teacher and medical = identified by teacher recommendation and by medical risk factors
Neither teacher nor medical = not identified by either teacher recommendation or by medical risk factors.

[††] The group identified by both teacher and audiometric test was too small to permit generalization.

[‡‡] No significant results = no pairwise comparisons were found to be statistically significant at the .05 level.

Table C-2 (Continued)

SIGNIFICANT DIFFERENCES IN MEAN ACHIEVEMENT AND MEAN EFSIQ SCORES FOR CHILDREN IDENTIFIED AS POSSIBLY HEARING, VISION, OR ORTHOPEDICALLY IMPAIRED USING VARIOUS INDICATORS
(Overall significance level = .05)
(See Tables 9, 15, 22; Section III)

	Significance Pairwise Comparisons (Z Score)				
	Hearing Handicaps		Vision Handicaps	Orthopedic Handicaps	
	Teacher or Audiometry Test[*] [††]	Teacher or Parent Responses[†]	Teacher or Vision Test[‡]	Teacher or Parent Responses[§]	Teacher or Medical Risk Factors[**]
Mean EFSIQ Scores	Neither teacher nor test > Test only (2.79)	No significant results[‡‡]	Test only > Teacher only (4.61) Test only > Neither teacher nor test (3.51)	No significant results	No significant results

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[*] Comparison of children identified as possibly hearing handicapped from teacher recommendation with those identified by the audiometry test and those not identified:

Teacher only = identified only by teacher recommendation
Test only = identified only by the audiometry test
Both teacher and test = identified by teacher recommendation and by audiometric test
Neither teacher nor test = not identified by either teacher recommendation or by audiometric test.

[†] Comparison of children identified as possibly hearing handicapped from teacher recommendation with those identified by parent responses and those not identified:

Teacher only = identified only by teacher recommendation
Parent only = identified only by parent responses
Both teacher and parent = identified by teacher recommendation and by parent responses
Neither teacher nor parent = not identified by either teacher recommendation or by parent responses.

[‡] Comparison of children identified as possibly visually handicapped from teacher recommendation with those identified by the vision test (uncorrected visual acuity ≤20/200 or ≤14/140) and those not identified:

Teacher only = identified only by teacher recommendation
Test only = identified only by the vision test
Both teacher and test = identified by teacher recommendation and by vision test
Neither teacher nor test = not identified by either teacher recommendation or by vision test.

[§] Comparison of children identified as possibly orthopedically handicapped from teacher recommendation with those identified by parent responses and those not identified:

Teacher only = identified only by teacher recommendation
Parent only = identified only by parent responses
Both teacher and parent = identified by teacher recommendation and by parent responses
Neither teacher nor parent = not identified by either teacher recommendation or by parent responses.

[**] Comparison of children identified as possibly orthopedically handicapped from teacher recommendation with those identified by medical risk factors and those not identified:

Teacher only = identified only by teacher recommendation
Medical only = identified only by medical risk factors
Both teacher and medical = identified by teacher recommendation and by medical risk factors
Neither teacher nor medical = not identified by either teacher recommendation or by medical risk factors.

[††] The group identified by both teacher and audiometric test was too small to permit generalization.

[‡‡] No significant results = no pairwise comparisons were found to be statistically significant at the .05 level.

Table C-3

SIGNIFICANT DIFFERENCES IN RATES OF IDENTIFICATION FOR POTENTIAL NEED FOR SERVICES FOR THE HEARING, VISION OR ORTHOPEDICALLY HANDICAPPED ACROSS DEMOGRAPHIC AND SOCIOECONOMIC GROUPS
(Overall significance level = .05)
(See Tables 10, 16, 23; Section III)

		Significant Pairwise Comparisons (Z Score)					
Handicap	Identifier	Sex	Race	Income	Age	Region	Type of Place
Hearing	Teacher Recommendation[†]	No significant results[*]	No significant results	No significant results	No significant results	No significant results	No significant results
	Audiometry Test[†]	No significant results	No significant results	No significant results[‡]	No significant results[§]	No significant results	No significant results[**]
	Parent Responses[†]	No significant results	No significant results	Less than $3,000 > $10,000-$14,999 (3.60) $5,000-$6,999 > $10,000-$14,999 (4.24)	No significant results	South > Northeast (2.82) South > West (3.24)	No significant results
Vision	Teacher Recommendation[†]	No significant results	No significant results	No significant results	10-11 > 6-7 (2.88)	South > West (3.41)	No significant results
	Visual Acuity Test[†]	No significant results	White > Black (2.08)	No significant results	8-9 > 6-7 (3.56) 10-11 > 6-7 (5.57) 10-11 > 8-9 (3.15)	Midwest > South (2.75)	No significant results
Orthopedic	Teacher Recommendation[†]	No significant results	No significant results	No significant results[††]	No significant results	No significant results	No significant results
	Medical Risk Factors[†]	No significant results	No significant results	No significant results	No significant results	No significant results	No significant results
	Parent Responses[†]	No significant results	No significant results	No significant results	10-11 > 6-7 (2.74) 10-11 > 8-9 (3.59)	No significant results	No significant results

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[*] No significant results = No pairwise comparisons were found to be statistically significant at the .05 level.

[†] Includes all children so identified, whether those children were also identified by another set of indicators or not.

[‡] The rate for groups "$3,000-$4,999"; $7,000-$9,999"; $10,000-$14,999" and "More than $15,000" is 0.

[§] The rate for group "6-7" is 0.

[**] The rate for group "250,000-3 million" is 0.

[††] The rate for group $10,000-$14,999" is 0.

Table C-4

SIGNIFICANT DIFFERENCES IN SCHOOL BEHAVIORS FOR CHILDREN IDENTIFIED AS POSSIBLY MENTALLY RETARDED OR EMOTIONALLY DISTURBED USING VARIOUS INDICATORS
(Overall significance level = .05)
(See Tables 27, 28, 41; Section IV)

	Significant Pairwise Comparison (Z Score)		
	Mentally Retarded		Emotionally Disturbed
School Behaviors (Rated by the Teacher)	Teacher or EFSIQ Test Score*	Teacher or Parent Responses†	Teacher or Parent Responses‡
Repeated a grade	Teacher only > Neither teacher nor test (5.19)	Teacher only > Neither teacher nor parent (5.96)	Teacher only > Parent only (4.08)
	Test only > Neither teacher nor test (11.65)	Parent only > Neither teacher nor parent (6.08)	Teacher only > Neither teacher nor parent (6.26)
	Both teacher and test > Neither teacher nor test (3.88)	Both teacher and parent > Neither teacher nor parent (3.59)	Both teacher and parent > Neither teacher nor parent (3.18)
Less attentive than most for his/her age	Teacher only > Test only (3.71)	Teacher only > Neither teacher nor parent (8.55)	Teacher only > Parent only (10.27)
	Teacher only > Neither teacher nor test (9.42)	Parent only > Neither teacher nor parent (3.54)	Teacher only > Neither teacher nor parent (16.72)
	Test only > Neither teacher nor test (4.42)	Both teacher and parent > Teacher only (2.97)	Parent only > Neither teacher nor parent (6.09)
	Both teacher and test > Test only (4.87)	Both teacher and parent > Parent only (4.60)	Both teacher and parent > Parent only (11.51)
	Both teacher and test > Neither teacher nor test (8.21)	Both teacher and parent > Neither teacher nor parent (10.71)	Both teacher and parent > Neither teacher nor parent (16.97)

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[*] Comparison of children identified as possibly mentally retarded from teacher recommendation with those identified by the EFSIQ test and those not identified:
Teacher only = identified only by teacher recommendation
Test only = identified only by the EFSIQ test
Both teacher and test = identified by teacher recommendation and by EFSIQ test
Neither teacher nor test = not identified by either teacher recommendation or by EFSIQ test.

[†] Comparison of children identified as possibly mentally retarded from teacher recommendation with those identified by parent responses and those not identified.
Teacher only = identified only by teacher recommendation
Parent only = identified only by parent responses
Both teacher and parent = identified by teacher recommendation and by parent responses
Neither teacher nor parent = not identified by either teacher recommendation or by parent responses.

[‡] Comparison of children identified as possibly emotionally disturbed from teacher recommendation with those identified by parent responses and those not identified:
Teacher only = identified only by teacher recommendation
Parent only = identified only by parent responses
Both teacher and parent = identified by teacher recommendation and by parent responses
Neither teacher nor parent = not identified by either teacher recommendation or by parent responses.

Table C-4 (Continued)

SIGNIFICANT DIFFERENCES IN SCHOOL BEHAVIORS FOR CHILDREN IDENTIFIED AS POSSIBLY MENTALLY RETARDED OR EMOTIONALLY DISTURBED USING VARIOUS INDICATORS

(Overall significance level = .05)
(See Tables 27, 28, 41: Section IV)

	Significant Pairwise Comparison (Z Score)		
	Mentally Retarded		Emotionally Disturbed
School Behaviors (Rated by the Teacher)	Teacher or EFSIQ Test Score[*]	Teacher or Parent Responses[†]	Teacher or Parent Responses[‡]
Extremely restless for his/her age	Teacher only > Test only (3.57)	Teacher only > Neither teacher nor parent (4.71)	Teacher only > Parent only (10.52)
	Teacher only > Neither teacher nor test (4.63)	Teacher only > Neither teacher nor parent (4.09)	Teacher only > Neither teacher nor parent (13.58)
	Both teacher and test > Test only (3.44)		Both teacher and parent > Parent only (7.17)
	Both teacher and test > Neither teacher nor test (3.98)		Both teacher and parent > Neither teacher nor parent (8.00)
Often accused by other children of fighting	No significant results[§]	Teacher only > Neither teacher nor parent (2.72)	Teacher only > Parent only (5.69)
			Teacher only > Neither teacher nor parent (8.76)
			Parent only > Neither teacher nor parent (4.44)
			Both teacher and parent > Parent only (2.92)
			Both teacher and parent > Neither teacher nor parent (3.69)

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[*] Comparison of children identified as possibly mentally retarded from teacher recommendation with those identified by the EFSIQ test and those not identified:
Teacher only = identified only by teacher recommendation
Test only = identified only by the EFSIQ test
Both teacher and test = identified by teacher recommendation and by EFSIQ test
Neither teacher nor test = not identified by either teacher recommendation or by EFSIQ test.

[†] Comparison of children identified as possibly mentally retarded from teacher recommendation with those identified by parent responses and those not identified:
Teacher only = identified only by teacher recommendation
Parent only = identified only by parent responses
Both teacher and parent = identified by teacher recommendation and by parent responses
Neither teacher nor parent = not identified by either teacher recommendation or by parent responses.

[‡] Comparison of children identified as possibly emotionally disturbed from teacher recommendation with those identified by parent responses and those not identified:
Teacher only = identified only by teacher recommendation
Parent only = identified only by parent responses
Both teacher and parent = identified by teacher recommendation and by parent responses
Neither teacher nor parent = not identified by either teacher recommendation or by parent responses.

[§] No significant results = no pairwise comparisons were found to be statistically significant at the .05 level.

Table C-4 (Continued)

SIGNIFICANT DIFFERENCES IN SCHOOL BEHAVIORS FOR CHILDREN IDENTIFIED AS POSSIBLY MENTALLY RETARDED OR EMOTIONALLY DISTURBED USING VARIOUS INDICATORS
(Overall significance level = .05)
(See Tables 27, 28, 41: Section IV)

	Significant Pairwise Comparison (Z Score)		
	Mentally Retarded		Emotionally Disturbed
School Behaviors (Rated by the Teacher)	Teacher or EFSIQ Test Score[*]	Teacher or Parent Responses[†]	Teacher or Parent Responses[‡]
Too "rough" with other children	No significant results[§]	Teacher only > Neither teacher nor parent (2.85)	Teacher only > Parent only (5.21) Teacher only > Neither teacher nor parent (6.97) Both teacher and parent > Neither teacher nor parent (2.67)
Frequently injured	No significant results	No significant results	Teacher only > Parent only (3.79) Teacher only > Neither teacher nor parent (4.81)
Other parents complain about his/her behavior	No significant results	No significant results	Teacher only > Parent only (3.49) Teacher only > Neither teacher nor parent (4.36)

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[*] Comparison of children identified as possibly mentally retarded from teacher recommendation with those identified by the EFSIQ test and those not identified:
Teacher only = identified only by teacher recommendation
Test only = identified only by the EFSIQ test
Both teacher and test = identified by teacher recommendation and by EFSIQ test
Neither teacher nor test = not identified by either teacher recommendation or by EFSIQ test.

[†] Comparison of children identified as possibly mentally retarded from teacher recommendation with those identified by parent responses and those not identified:
Teacher only = identified only by teacher recommendation
Parent only = identified only by parent responses
Both teacher and parent = identified by teacher recommendation and by parent responses
Neither teacher nor parent = not identified by either teacher recommendation or by parent responses.

[‡] Comparison of children identified as possibly emotionally disturbed from teacher recommendation with those identified by parent responses and those not identified:
Teacher only = identified only by teacher recommendation
Parent only = identified only by parent responses
Both teacher and parent = identified by teacher recommendation and by parent responses
Neither teacher nor parent = not identified by either teacher recommendation or by parent responses.

[§] No significant results = no pairwise comparisons were found to be statistically significant at the .05 level.

Table C-4 (Continued)

SIGNIFICANT DIFFERENCES IN SCHOOL BEHAVIORS FOR CHILDREN IDENTIFIED AS POSSIBLY MENTALLY RETARDED OR EMOTIONALLY DISTURBED USING VARIOUS INDICATORS

(Overall significance level = .05)
(See Tables 27, 28, 41; Section IV)

	Significant Pairwise Comparison (Z Score)		
	Mentally Retarded		Emotionally Disturbed
School Behaviors (Rated by the Teacher)	Teacher or EFSIQ Test Score[*]	Teacher or Parent Responses[†]	Teacher or Parent Responses[‡]
Discipline does not seem to work	No significant results[§]	Both teacher and parent > Parent only (14.46)	Teacher only > Parent only (5.26) Teacher only > Neither teacher nor parent (6.10) Both teacher and parent > Parent only (3.25) Both teacher and parent > Neither teacher nor parent (3.40)
Discipline frequently required	Teacher only > Neither teacher nor test (3.07) Both teacher and test > Neither teacher nor test (2.76)	Teacher only > Neither teacher nor parent (3.72) Both teacher and parent > Parent only (2.63) Both teacher and parent > Neither teacher nor parent (3.21)	Teacher only > Parent only (6.85) Teacher only > Neither teacher nor parent (10.37) Both teacher and parent > Parent only (5.73) Both teacher and parent > Neither teacher nor parent (6.81)
Almost always chosen last in children's play	Test only > Neither teacher nor test (3.13)	No significant results	Teacher only > Parent only (7.25) Teacher only > Neither teacher nor parent (8.30)

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[*] Comparison of children identified as possibly mentally retarded from teacher recommendation with those identified by the EFSIQ test and those not identified:
Teacher only = identified only by teacher recommendation
Test only = identified only by the EFSIQ test
Both teacher and test = identified by teacher recommendation and by EFSIQ test
Neither teacher nor test = not identified by either teacher recommendation or by EFSIQ test.

[†] Comparison of children identified as possibly mentally retarded from teacher recommendation with those identified by parent responses and those not identified:
Teacher only = identified only by teacher recommendation
Parent only = identified only by parent responses
Both teacher and parent = identified by teacher recommendation and by parent responses
Neither teacher nor parent = not identified by either teacher recommendation or by parent responses.

[‡] Comparison of children identified as possibly emotionally disturbed from teacher recommendation with those identified by parent responses and those not identified:
Teacher only = identified only by teacher recommendation
Parent only = identified only by parent responses
Both teacher and parent = identified by teacher recommendation and by parent responses
Neither teacher nor parent = not identified by either teacher recommendation or by parent responses.

[§] No significant results = no pairwise comparisons were found to be statistically significant at the .05 level.

Table C-4 (Concluded)

SIGNIFICANT DIFFERENCES IN SCHOOL BEHAVIORS FOR CHILDREN IDENTIFIED AS POSSIBLY MENTALLY RETARDED OR EMOTIONALLY DISTURBED USING VARIOUS INDICATORS
(Overall significance level = .05)
(See Tables 27, 28, 41; Section IV)

	Significant Pairwise Comparison (Z Score)		
	Mentally Retarded		Emotionally Disturbed
School Behaviors (Rated by the Teacher)	Teacher or EFSIQ Test Score*	Teacher or Parent Responses†	Teacher or Parent Responses‡
Almost never chosen as leader in children's play	Teacher only > Neither teacher nor test (6.02)	Teacher only > Neither teacher nor parent (6.65)	Teacher only > Parent only (10.58)
	Test only > Neither teacher nor test (2.64)	Parent only > Neither teacher nor parent (4.08)	Teacher only > Neither teacher nor parent (14.65)
	Both teacher and test > Neither teacher nor test (4.43)	Both teacher and parent > Neither teacher nor parent (3.20)	Both teacher and parent > Parent only (8.27)
			Both teacher and parent > Neither teacher nor parent (9.32)
Intellectual ability clearly below average (bottom 25%) for his/her age	Teacher only > Test only (3.93)	Teacher only > Parent only (4.76)	Teacher only > Parent only (4.54)
	Teacher only > Neither teacher nor test (22.05)	Teacher only > Neither teacher nor parent (22.46)	Teacher only > Neither teacher nor parent (10.85)
	Test only > Neither teacher nor test (5.41)	Both teacher and parent > Parent only (5.65)	Parent only > Neither teacher nor parent (3.64)
	Both teacher and test > Test only (5.21)	Both teacher and parent > Neither teacher nor parent (128.39)	Both teacher and parent > Parent only (2.63)
	Both teacher and test > Neither teacher nor test (133.03)		Both teacher and parent > Neither teacher nor parent (3.72)

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*Comparison of children identified as possibly mentally retarded from teacher recommendation with those identified by the EFSIQ test and those not identified:

Teacher only = identified only by teacher recommendation
Test only = identified only by the EFSIQ test
Both teacher and test = identified by teacher recommendation and by EFSIQ test
Neither teacher nor test = not identified by either teacher recommendation or by EFSIQ test

†Comparison of children identified as possibly mentally retarded from teacher recommendation with those identified by parent responses and those not identified:

Teacher only = identified only by teacher recommendation
Parent only = identified only by parent responses
Both teacher and parent = identified by teacher recommendation and by parent responses
Neither teacher nor parent = not identified by either teacher recommendation or by parent responses

‡Comparison of children identified as possibly emotionally disturbed from teacher recommendation with those identified by parent responses and those not identified:

Teacher only = identified only by teacher recommendation
Parent only = identified only by parent responses
Both teacher and parent = identified by teacher recommendation and by parent response
Neither teacher nor parent = not identified by either teacher recommendation or by parent responses

Table C-5

SIGNIFICANT DIFFERENCES IN MEAN ACHIEVEMENT AND MEAN EFSIQ SCORES FOR CHILDREN IDENTIFIED AS POSSIBLY MENTALLY RETARDED OR EMOTIONALLY DISTURBED USING VARIOUS INDICATORS

(Overall significance level = .05)
(See Tables 36, 44; Section IV)

	Significant Pairwise Comparisons (Z Score)			
	Mentally Retarded			Emotionally Disturbed
	Teacher and/or EFSIQ Test Score*	Teacher and/or Parent Responses†	Teacher and/or Medical Risk Factors‡	Teacher and/or Parent Responses
Mean Achievement Scores				
Mean WRAT Reading	Teacher only > Both teacher and test (4.67)	Parent only > Teacher only (3.76)	Medical exam only > Teacher only (4.37)	Parent only > Teacher only (3.06)
	Test only > Both teacher and test (4.96)	Parent only > Both teacher and parent (5.40)	Medical exam only > Both teacher and medical exam (4.07)	Neither teacher nor parent > Teacher only (7.05)
	Neither teacher nor test > Teacher only (14.57)	Neither teacher nor parent > Teacher only (15.95)	Neither medical exam nor teacher > Teacher only (16.39)	Neither teacher nor parent > Parent only (2.70)
	Neither teacher nor test > Test only (9.28)	Neither teacher nor parent > Parent only (4.84)	Neither medical exam nor teacher > Both medical exam and teacher (7.51)	
	Neither teacher nor test > Both teacher and test (21.59)	Neither teacher nor parent > Both teacher and parent (15.79)		

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*Comparison of children identified as possibly mentally retarded from teacher recommendation with those identified by the EFSIQ test and those not identified:

Teacher only = identified only by teacher recommendation
Test only = identified only by the EFSIQ test
Both teacher and test = identified by teacher recommendation and by the EFSIQ test
Neither teacher nor test = not identified by either teacher recommendation or by the EFSIQ test

†Comparison of children identified as possibly mentally retarded from teacher recommendation with those identified by parent responses and those not identified:

Teacher only = identified only by teacher recommendation
Parent only = identified only by parent responses
Both teacher and parent = identified by teacher recommendation and by parent responses
Neither teacher nor parent = not identified by either teacher recommendation or by parent responses

‡Comparison of children identified as possibly mentally retarded from teacher recommendation with those identified by medical risk factors and those not identified:

Medical exam only = identified only by medical risk factors
Teacher only = identified only by teacher recommendation
Both medical exam and teacher = identified by medical risk factors and by teacher recommendation
Neither medical exam nor teacher = not identified by either medical risk factors or by teacher recommendation

Comparison of children identified as possibly emotionally disturbed from teacher recommendation with those identified by parent responses and those not identified:

Parent only = identified only by parent responses
Teacher only = identified only by teacher recommendation
Neither teacher nor parent = not identified by either teacher recommendation or by parent responses

Table C-5 (Continued)

SIGNIFICANT DIFFERENCES IN MEAN ACHIEVEMENT AND MEAN EFSIQ SCORES FOR CHILDREN IDENTIFIED AS POSSIBLY MENTALLY RETARDED OR EMOTIONALLY DISTURBED USING VARIOUS INDICATORS
(Overall significance level = .05)
(See Tables 36, 44; Section IV)

	Significant Pairwise Comparisons (Z Score)			
	Mentally Retarded			
	Teacher and/or EFSIQ Test Score*	Teacher and/or Parent Responses†	Teacher and/or Medical Risk Factors‡	Teacher and/or Parent Responses§
Mean Achievement Scores				
Mean WRAT Math	Teacher only > Both teacher and test (6.08)	Teacher only > Both teacher and parent (2.92)	Medical exam only > Teacher only (5.24)	Parent only > Teacher only (3.52)
	Test only > Both teacher and test (5.88)	Parent only > Teacher only (3.78)	Medical exam only > Both teacher and medical exam (4.34)	Neither teacher nor parent > Teacher only (8.44)
	Neither teacher nor test > Teacher only (14.18)	Parent only > Both teacher and parent (5.72)	Neither medical exam nor teacher > Teacher only (14.17)	Neither teacher nor parent > Parent only (3.22)
	Neither teacher nor test > Test only (9.44)	Neither teacher nor parent > Teacher only (13.84)	Neither medical exam nor teacher > Both medical exam and teacher (6.34)	
	Neither teacher nor test > Both teacher and test (22.05)	Neither teacher nor parent > Parent only (4.51)		
		Neither teacher nor parent > Both teacher and parent (13.81)		

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*Comparison of children identified as possibly mentally retarded from teacher recommendation with those identified by the EFSIQ test and those not identified:
Teacher only = identified only by teacher recommendation
Test only = identified only by the EFSIQ test
Both teacher and test = identified by teacher recommendation and by the EFSIQ test
Neither teacher nor test = not identified by either teacher recommendation or by the EFSIQ test

†Comparison of children identified as possibly mentally retarded from teacher recommendation with those identified by parent responses and those not identified:
Teacher only = identified only by teacher recommendation
Parent only = identified only by parent responses
Both teacher and parent = identified by teacher recommendation and by parent responses
Neither teacher nor parent = not identified by teacher recommendation or by parent responses

‡Comparison of children identified as possibly mentally retarded from teacher recommendation with those identified by medical risk factors and those not identified:
Medical exam only = identified only by medical risk factors
Teacher only = identified only by teacher recommendation
Both medical exam and teacher = identified by medical risk factors and by teacher recommendation
Neither medical exam nor teacher = not identified by medical risk factors or by teacher recommendation

§Comparison of children identified as possibly emotionally disturbed from teacher recommendation with those identified by parent responses and those not identified:
Parent only = identified only by parent responses
Teacher only = identified only by teacher recommendation
Neither teacher nor parent = not identified by either teacher recommendation or by parent responses

Table C-5 (Concluded)

SIGNIFICANT DIFFERENCES IN MEAN ACHIEVEMENT AND MEAN EFSIQ SCORES FOR CHILDREN IDENTIFIED AS POSSIBLY MENTALLY RETARDED OR EMOTIONALLY DISTURBED USING VARIOUS INDICATORS

(Overall significance level = .05)
(See Tables 36, 44; Section IV)

	Significant Pairwise Comparisons (Z Score)			
	Mentally Retarded			
	Teacher and/or EFSIQ Test Score[*]	Teacher and/or Parent Responses[†]	Teacher and/or Medical Risk Factors[‡]	Teacher and/or Parent Responses[§]
Mean EFSIQ Scores	Teacher only > Test only (9.74)	Teacher only > Both teacher and parent (3.70)	Medical exam only > Teacher only (5.33)	Parent only > Teacher only (2.78)
	Teacher only > Both teacher and test (10.87)	Parent only > Both teacher and parent (3.70)	Medical exam only > Both teacher and medical exam (4.51)	Neither teacher nor parent > Teacher only (5.83)
	Test only > Both teacher and test (4.14)	Neither teacher nor parent > Teacher only (7.68)	Neither medical exam nor teacher > Teacher only (8.66)	
	Neither teacher nor test > Teacher only (8.66)	Neither teacher nor parent > Parent only (4.16)	Neither medical exam nor teacher > Both teacher and medical exam (5.01)	
	Neither teacher nor test > Test only (44.48)	Neither teacher nor parent > Both teacher and parent (10.03)		
	Neither teacher nor test > Both teacher and test (29.92)			

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[*] Comparison of children identified as possibly mentally retarded from teacher recommendation with those identified by the EFSIQ test and those not identified:
Teacher only = identified only by teacher recommendation
Test only = identified only by the EFSIQ test
Both teacher and test = identified by teacher recommendation and by the EFSIQ test
Neither teacher nor test = not identified by either teacher recommendation or by the EFSIQ test

[†] Comparison of children identified as possibly mentally retarded from teacher recommendation with those identified by parent responses and those not identified:
Teacher only = identified only by teacher recommendation
Parent only = identified only by parent responses
Both teacher and parent = identified by teacher recommendation and by parent responses
Neither teacher nor parent = not identified by teacher recommendation or by parent responses

[‡] Comparison of children identified as possibly mentally retarded from teacher recommendation with those identified by medical risk factors and those not identified:
Medical examn only = identified only by medical risk factors
Teacher only = identified only by teacher recommendation
Both medical exam and teacher = identified by medical risk factors and by teacher recommendation
Neither medical exam nor teacher = not identified by medical risk factors or by teacher recommendation

[§] Comparison of children identified as possibly emotionally disturbed from teacher recommendation with those identified by parent responses and those not identified:
Parent only = identified only by parent responses
Teacher only = identified only by teacher recommendation
Neither parent nor teacher = not identified by either parent responses or by teacher recommendation

Table C-6

SIGNIFICANT DIFFERENCES IN RATES OF IDENTIFICATION FOR POTENTIAL NEED FOR SERVICES FOR THE MENTALLY RETARDED OR EMOTIONALLY DISTRUBED ACROSS DEMOGRAPHIC AND SOCIOECONOMIC GROUPS

(Overall significance level = .05)
(See Tables 37, 45; Section IV)

		Significant Pairwise Comparisons (Z Score)					
Handicap	Identifier	Sex	Race	Income	Age	Region	Type of Place
Mental Retardation	Teacher Recommendation[†]	Males > Females (2.75)	Blacks > Whites (3.54)	No significant results[*] [‡]	10-11 > 6-7 (2.87)	No significant results	No significant results
	EFSIQ Score[†]	No significant results	Blacks > Whites (2.70)	Less than $3,000 > $5,000-$6,999[§] (3.09)	10-11 > 6-7 (3.10)	No significant results	No significant results
	Parent Responses[†]	No significant results	Blacks > Whites (2.25)	No significant results	No significant results	No significant results	No significant results[**]
	Medical Risk Factors[†]	No significant results	No significant results[††]	No significant results[‡‡]	No significant results	North-east > South (2.83)	No significant results[**]
Emotional Disturbance	Teacher Recommendation[†]	Males > Females (3.60)	Blacks > Whites (2.89)	No significant results	8-9 > 6-7 (2.54) 10-11 > 6-7 (3.03)	No significant results	No significant results
	Parent Responses[†]	No significant results	No significant results	Less than $3,000 > More than $15,000 (3.37)	6-7 > 10-11 (2.99)	No significant results	No significant results

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[*] No significant results = No pairwise comparisons were found to be statistically significant at the .05 level.

[†] Includes all children so identified, whether those children were also identified by another set of indicators or not.

[‡] Groups "$10,000-$14,999" and "More than $15,000" too small to permit generalization.

[§] Groups "$7,000-$9,999"; "$10,000-$14,999" and "More than $15,000" too small to permit generalization.

[**] Group "50,000-250,000 people" too small to permit generalization.

[††] Group "Blacks" too small to permit generalization.

[‡‡] Groups "Less than $3,000" and "More than $15,000" too small to permit generalization.

Table C-7

SIGNIFICANT DIFFERENCES IN SCHOOL BEHAVIORS FOR CHILDREN IDENTIFIED AS POSSIBLY SPEECH HANDICAPPED USING VARIOUS INDICATORS AND AS POSSIBLY BEING "SLOW LEARNERS" USING TEACHER RECOMMENDATION
(Overall significance level = .05)
(See Table 51, Section V, and Table 59, Section VI)

	Significant Pairwise Comparison (Z Score)	
	Speech Handicapped	"Slow Learners"†
School Behaviors (Rated by the teacher)	Teacher Recommendation or Parent Responses*	
Repeated a grade	Parent only > Neither teacher nor parent (2.99)	Slow only > Not recommended for slow learner resources (8.42)
	Both teacher and parent > Neither teacher nor parent (4.07)	Teacher recommendation for both slow learner and other special resource > Not recommended for slow learner resources (10.64)
Less attentive than most for his/her age	Teacher only > Neither teacher nor parent (2.64)	Slow only > Not recommended for slow learner (18.40)
	Parent only > Neither teacher nor parent (3.95)	Teacher recommendation for both slow learner and other special resource > Not recommended for slow learner resources (8.15)
	Both teacher and parent > Neither teacher nor parent (3.19)	
Extremely restless for his/her age	Parent only > Neither teacher nor parent (3.40)	Slow only > Not recommended for slow learner resources (5.04)
		Teacher recommendation for both slow learner and other special resource > Not recommended for slow learner resources (4.75)
Often accused by other children of fighting	No significant results‡	Slow only > Not recommended for slow learner resources (5.20)
		Teacher recommendation for both slow learner and other special resource > Not recommended for slow learner resources (4.61)

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[*] Comparison of children identified as speech handicapped from teacher recommendation with those identified from parent responses and those not identified.
Parent only = Identified only by parent responses
Teacher only = Identified only by teacher recommendation
Both parent and teacher = Identified by parent responses and by teacher recommendation.
Neither teacher nor parent = not identified by teacher recommendation or by parent responses.

[†] Comparison of children identified by teacher recommendation only for special resources for the slow learner with those recommended for both special resources for the slow learner and for other special resources; and those not recommended for special resources for the slow learner.

[‡] No significant results = no pairwise comparisons were found to be statistically significant at the .05 level.

Table C-7 (Continued)

SIGNIFICANT DIFFERENCES IN SCHOOL BEHAVIORS FOR CHILDREN IDENTIFIED AS POSSIBLY SPEECH HANDICAPPED USING VARIOUS INDICATORS AND AS POSSIBLY BEING "SLOW LEARNERS" USING TEACHER RECOMMENDATION

(Overall significance level = .05)
(See Table 51, Section V, and Table 59, Section VI)

	Significant Pairwise Comparison (Z Score)	
	Speech Handicapped	"Slow Learners"[†]
School Behaviors (Rated by the teacher)	Teacher Recommendation or Parent Responses[*]	
Too "rough" with other children	No significant results[‡]	Slow only > Not recommended for slow learner resources (6.62)
		Teacher recommendation for both slow learner and other special resource > Not recommended for slow learner resources (3.74)
Frequently injured	No significant results	No significant results
Other parents complain about his/her behavior	No significant results	No significant results
Discipline does not seem to work	No significant results	Slow only > Not recommended for slow learner resources (3.23)
		Teacher recommendation for both slow learner and other special resource > Not recommended for slow learner resources (2.63)
Discipline frequently required	No significant results	Slow only > Not recommended for slow learner resources (5.54)
		Teacher recommendation for both slow learner and other special resource > Not recommended for slow learner resources (4.04)
Almost always chosen last in children's play	Teacher only > Neither teacher nor parent (2.71)	Slow only > Not recommended for slow learner resources (8.36)
	Parent only > Neither teacher nor parent (2.81)	Teacher recommendation for both slow learner and other special resource > Slow only (2.68)
	Both teacher and parent > Neither teacher nor parent (4.10)	Teacher recommendation for both slow learner and other special resource > Not recommended for slow learner resources (8.62)

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[*] Comparison of children identified as speech handicapped from teacher recommendation with those identified from parent responses and those not identified.
Parent only = Identified only by parent responses
Teacher only = Identified only by teacher recommendation
Both parent and teacher = Identified by parent responses and by teacher recommendation.
Neither teacher nor parent = not identified by teacher recommendation or by parent responses.

[†] Comparison of children identified by teacher recommendation only for special resources for the slow learner with those recommended for both special resources for the slow learner and for other special resources for the slow learner.

[‡] No significant results = No pairwise comparisons were found to be statistically significant at the .05 level.

Table C-7 **(Concluded)**

SIGNIFICANT DIFFERENCES IN SCHOOL BEHAVIORS FOR CHILDREN IDENTIFIED AS POSSIBLY SPEECH HANDICAPPED USING VARIOUS INDICATORS AND AS POSSIBLY BEING "SLOW LEARNERS" USING TEACHER RECOMMENDATION
(Overall significance level = .05)
(See Table 51, Section V, and Table 59, Section VI)

	Significant Pairwise Comparison (Z Score)	
	Speech Handicapped	"Slow Learners"[†]
chool Behaviors (Rated by the teacher)	Teacher Recommendation or Parent Responses[*]	
lmost never chosen as leader in hildren's play	Teacher only > Neither teacher nor parent (4.82)	Slow only > Not recommended for slow learner resources (16.93)
	Parent only > Neither teacher nor parent (4.02)	Teacher recommendation for both slow learner and other special resource > Slow only (2.98)
	Both teacher and parent > Neither teacher nor parent (3.88)	Teacher recommendation for both slow learner and other special resource > Not recommended for slow learner resources (14.53)
ntellectual ability clearly below verage (bottom 25%) for his/her age	Teacher only > Neither teacher nor parent (4.08)	Slow only > Not recommended for slow learner resources (42.30)
	Parent only > Neither teacher nor parent (3.94)	Teacher recommendation for both slow learner and other special resource > Not recommended for slow learner resources (21.37)
	Both teacher and parent > Neither teacher nor parent (6.37)	

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[*] Comparison of children identified as speech handicapped from teacher recommendation with those identified from parent responses and those not identified:
Parent only = Identified only by parent responses
Teacher only = Identified only by teacher recommendation
Both parent and teacher = Identified by parent responses and by teacher recommendation
Neither teacher nor parent = Not identified by teacher recommendation or by parent responses.

[†] Comparison of children identified by teacher recommendation only for special resources for the slow learner with those recommended for both special resources for the slow learner and for other special resources for the slow learner.

Table C-8

SIGNIFICANT DIFFERENCES IN MEAN ACHIEVEMENT AND MEAN EFSIQ SCORES FOR CHILDREN IDENTIFIED AS POSSIBLY SPEECH HANDICAPPED USING VARIOUS INDICATORS AND AS POSSIBLY "SLOW LEARNERS" USING TEACHER RECOMMENDATION

(Overall significance level = .05)
(See Table 52, Section V, and Table 62, Section VI)

	Significant Pairwise Comparison (Z Score)	
	Speech Handicapped	"Slow Learners"†
	Teacher Recommendation or Parent Responses*	
Mean Achievement Scores		
Mean WRAT Reading	Neither teacher nor parent ≥ Teacher only (3.99)	Slow only ≥ Teacher recommendation for both slow learner and other special resource (2.69)
	Neither teacher nor parent ≥ Parent only (6.73)	Not recommended for slow learner resource ≥ Slow only (17.06)
	Neither teacher nor parent ≥ Both teacher and parent (5.87)	Not recommended for slow learner resource ≥ Teacher recommendation for both slow learner and other special resource (14.38)
Mean WRAT Math	Neither teacher nor parent ≥ Teacher only (3.33)	Slow only ≥ Teacher recommendation for both slow learner and other special resource (2.90)
	Neither teacher nor parent ≥ Parent only (5.17)	Not recommended for slow learner resource ≥ Slow only (10.48)
	Neither teacher nor parent ≥ Both teacher and parent (4.40)	Not recommended for slow learner resource ≥ Teacher recommendation for both slow learner and other special resource (12.81)
Mean EFSIQ Scores	Neither teacher nor parent ≥ Teacher only (3.79)	Slow only ≥ Teacher recommendation for both slow learner and other special resource (2.82)
	Neither teacher nor parent ≥ Parent only (3.97)	Not recommended for slow learner resource ≥ Slow only (8.96)
	Neither teacher nor parent ≥ Both teacher and parent (3.58)	Not recommended for slow learner resource ≥ Teacher recommendation for both slow learner and other special resource (11.18)

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*Comparison of children identified as speech handicapped from teacher recommendation with those identified from parent responses and those not identified.
Parent only = Identified only by parent responses
Teacher only = Identified only by teacher recommendation
Both parent and teacher = Identified by parent responses and by teacher recommendation.
Neither teacher nor parent = Not identified by teacher recommendation or by parent responses.

†Comparison of children identified by teacher recommendation only for special resources for the slow learner with those recommended for both special resources for the slow learner and for other special resources; and those not recommended for special resources for the slow learner.

Table C-9

SIGNIFICANT DIFFERENCES IN RATES OF IDENTIFICATION FOR POTENTIAL NEED FOR SERVICES FOR THE SPEECH HANDICAPPED AND "SLOW LEARNER" ACROSS DEMOGRAPHIC AND SOCIOECONOMIC GROUPS
(Overall significance level = .05)
(See Table 53, Section V, and Table 63, Section VI)

Handicap	Identifier	Significant Pairwise Comparisons (Z Score)					
		Sex	Race	Income	Age	Region	Type of Place
Speech	Teacher Recommendation[†]	Males > Females (3.29)	No significant results	No significant results	6-7 > 10-11 (4.15) 8-9 > 10-11 (3.10)	No significant results	No significant results
	Parent Responses[†]	Males > Females (3.72)	Blacks > Whites (4.13)	Less than $3,000 > $7,000-$9,999 (3.32) $3,000-$4,999 > $7,000-$9,999 (2.95)	6-7 > 8-9 (3.39) 6-7 > 10-11 (4.22)	No significant results	No significant results
	Medical Risk Factors[†]	No significant results	No significant results	No significant results[‡]	No significant results	No significant results[§]	No significant results[**]
Slow Learner	Teacher recommendation only for this resource[†]	Males > Females (3.84)	Blacks > Whites (2.74)	Less than $3,000 > $7,000-$9,999 (3.56) Less than $3,000 > $10,000-$14,999 (4.90) Less than $3,000 > More than $15,000 (5.09) $3,000-$4,999 > $7,000-$9,999 (4.43) $3,000-$4,999 > $10,000-$14,999 (6.86) $3,000-$4,999 > More than $15,000 (6.87) $5,000-$6,999 > $10,000-$14,999 (3.80) $5,000-$6,999 > More than $15,000 (4.04)	No significant results	South > Midwest (3.72)	No significant results

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[*] No significant results = No pairwise comparisons were found to be statistically significant at the .05 level.

[†] Includes all children so identified, whether those children were also identified by another set of indicators or not.

[‡] The rate for the group "More than $15,000" is 0.

[§] The rate for the group "West" is 0.

[**] The rate for the group "50,000-250,000 people" is 0.